MINERALOGICAL ABSTRACTS

(Vol. 7, No. 6, June, 1939.)

New Minerals.

LACHE (Charles) & FISHER (D. Jerome). *Gratonite—preliminary description of a new mineral from Cerro de Pasco, Peru.* Amer. Min., 1939, vol. 24, p. 136.

$Pb_9As_4S_{15}$, rhombohedral, $a:c = 1:0{\cdot}4428$. Dark lead-grey, black eak; H. $2\frac{1}{2}$, sp. gr. 6·22. Distinct from jordanite. L. J. S.

LE (W. A.), FOSHAG (W. F.), & VONSEN (M.). *Teepleite, a new mineral from Borax Lake, California.* Amer. Min., 1939, vol. 24, pp. 48–52. During the dry summer of 1934 Borax Lake nearly dried up, forming, pools of brine, crusts of halite, trona, and teepleite. The last as ular tetragonal crystals, or usually as 'roses' of lenticular crystals, ws the forms $c(001)$ and $e(101)$, with $a:c = 1:0{\cdot}6690$. Sp. gr. 2·076, 3–$3\frac{1}{2}$, ϵ 1·503, ω 1·519. Analysis, B_2O_4 22·05, Cl 18·72, CO_2 9·42, 28·93, Ca 0·08, H_2O 20·48, insol. 0·15 = 99·83, after deducting osed trona, gives $Na_2B_2O_4.2NaCl.4H_2O$. Crystals of the artificial show also the form $m(110)$ and have a unit cell of dimensions a 7·27, 4 Å.; space-group D^7_{4h}. The salt is readily soluble in water, and rain came it disappeared from the lake. L. J. S.

DOCH (Joseph). *Crystallography of veatchite.* Amer. Min., 1939, vol. 24, pp. 130–135, 2 figs.

niometric measurements of crystals of veatchite [M.A. 7–169] d in spaces between colemanite crystals on a single specimen from , California, agree with the elements previously given from X-ray , $a:b:c = 0{\cdot}163:1:0{\cdot}988$, but with $\beta = 58°\ 58'$ (not 67°). The als are capillary, or flattened on (010), with prims and domes and a ttful pyramid. L. J. S.

URA (Kenjiro) & HIRONAKA (Yosio). *Chemical investigations of Japanese minerals containing rarer elements. XXIII. On yamaguti-ite, a phosphorus bearing variety of zircon, found at Yamaguti village, Nagano prefecture.* Journ. Chem. Soc. Japan, 1936, vol. 57, pp. 1195–1199. (Japanese; English title from table of contents, p. x.) [Cf. Min. Mag., **24**–626.]

own to dark-brown crystals with $p(111)$, $a(100)$, pp' 56° 52′, D^{25}_4

3·971, gave SiO_2 21·35, P_2O_5 4·23, $(Zr,Hf)O_2$ 43·57, UO_2 2·08, ThO_2 3·5 rare-earths 15·89, TiO_2 nil, $(Nb,Ta)_2O_5+SnO_2$ 0·54, Al_2O_3 0·48, Fe_2 0·59, MnO 0·50, MgO 0·03, CaO 1·23, H_2O+ 6·08, CO_2 0·61 = 100·7 X-ray powder photographs show that the high content of P_2O_5 is r due to intermixture with xenotime. R. O.

Hata (Shin). *Xenotime and a variety of zircon from Iisaka.* Sci. Pap Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 619–622

Short-prismatic or pyramidal crystals of yellowish-green xenoti from pegmatite show the forms $z(111)$, $m(110)$; sp. gr. 4·46. Analy gave P_2O_5 25·38, Yt earths 51·82, Ce earths 2·14, ThO_2 2·47, ZrO_2 1· UO_2 3·17, SiO_2 4·32, Al_2O_3 4·80, FeO 1·10, MnO 1·72, MgO 0·02, C 0·61, H_2O 0·20 = 99·65. Radial aggregates or rarely single crys (p m a) of dark-green zircon, sp. gr. 4·11, gave SiO_2 23·00, P_2O_5 5 $(Zr,Hf)O_2$ 39·65, ThO_2 0·07, UO_2 4·93, Yt earths 10·23, Ce earths 0 $(Nb,Ta)_2O_5+SnO_2$ 1·03, TiO_2 0·90, Al_2O_3 3·53, Fe_2O_3 4·28, MnO 0 MgO 0·05, CaO 2·25, H_2O 2·89 = 98·93. Containing phosphorus rare-earths, this is the 'yamaguchilite' variety of zircon [Min. M **24**–626]. L. J. S

Nakai (Toshio). *On calcio-gadolinite, a new variety of gadolinite foun Tadati village, Nagano prefecture.* Bull. Chem. Soc. Japan, 1 vol. 13, pp. 591–594.

Massive material and rough prisms with the appearance of gadoli occurs in pegmatite with allanite, zircon, fergusonite, &c. It has sp. gr. α 1·765, β 1·774, γ 1·787, and is strongly pleochroic, α and β light yello dark brown. Analysis gave SiO_2 23·89, ThO_2 0·80, U_3O_8 0·10, Ce_2O_3 $(La,Yt)_2O_3$ &c. 24·47, Al_2O_3 1·68, Fe_2O_3 7·65, FeO 11·24, MnO BeO 10·73, MgO 0·14, CaO 11·91, H_2O+ 2·05, H_2O- 0·14 = '100 Spectroscopic analysis shows La, Ce, Pr, Nd, Sm, Gd, Dy, Er. Form $Be_2(Fe'',Fe''')(Ce,La,Yt,Ca)_2Si_2(O,OH)_{10}$, similar to gadolinite with earths partly replaced by calcium. L. J.

Herzenberg (Robert). *Brunckit* (*Zinksulfidgel*). Zentr. Min., Ab 1938, pp. 373–375.

A large body of white zinc ore in the Cercapuquio lead mine, w Cerro de Pasco, Peru, was thought to be calamine, but is amorphous zinc sulphide, evidently precipitated from solution. It is dull and pc Material containing 10·07 % H_2O has sp. gr. 2·92; dried at 105°, s

2. Small rhombohedra of smithsonite are present in cavities. Analysis
e S 32·1, Zn 65·1, Cd 2·08, Pb 0·12, FeO 0·38, MnO 0·40, insol. 0·48,
) trace, CO_2 n.d. = 100·66. L. J. S.

DDHUE (John Davis). *Some new carbon minerals—kansasite described.* The Mineralogist, Portland, Oregon, 1938, vol. 6, no. 1, pp. 7–8, 20–22.

— *Jelinite and associated minerals.* Ibid., 1938, vol. 6, no. 9, pp. 9–10.

. fossil resin (sp. gr. 1·05–1·06) from shale with associated coal-seams
r Ellsworth in Kansas is called kansasite, and afterwards renamed
nite. Amber (sp. gr. 1·085) from Equilleres, dep. Basses-Alpes,
nce, differs from Baltic amber in its reaction to solvents, and is
ed pseudo-succinite. For hartite [M.A. **1**–202; **2**–47, 474] a formula
H_{32} is suggested. L. J. S.

Meteorites and Tektites.

ATTMANN (S.) & MACHATSCHKI (F.). *Stand der Tübinger Meteoriten-sammlung mit Ende 1937.* Neues Jahrb. Min., Abt. A, 1938, Beil.-Bd. 74, pp. 279–292. Correction: Zentr. Min., Abt. A, 1938, p. 382.
atalogue of the meteorites in the collection of the University of
ingen [M.A. **6**–387] arranged in classes and in each class in order of
. 267 falls (151 stones, 15 stony-irons, and 101 irons) are represented
a total weight of 304 kg. L. J. S.

LIE (C. C.). *Definitions in meteoric astronomy.* (*Second note*). Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 521–522.
ictionary definitions with examples of loose usage are given of the
ns: meteor, meteorite, meteoroid, fireball, shooting star, and bolide.
eteoroid is the nucleus or solid part of a meteor before bursting. A
de is a detonating meteor. L. J. S.

TSON (Fletcher G.). *Reflectivity and colour of meteorites.* Proc. Nat. Acad. Sci. U.S.A., 1938, vol. 24, pp. 532–537, 3 figs.
ight reflected from flat surfaces of seven meteoritic stones and one
was measured with a spectral photometer, and percentages of re-
ion are plotted against wave-lengths. The flatness of the curves
cate grey colours, the reflectivity ranging from 5 to 30 %, corre-
nding with black to white. Stones and irons cannot be distinguished.
results are compared with the albedo of asteroids. [M.A. **7**–172.]
L. J. S.

Krinov (E. L.). *The spectrum reflecting power of stony meteorites.* Com Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 269–2 2 figs. [Cf. M.A. **7**–172.]

The intensity of daylight reflected at 45° from the broken surface 13 stony meteorites was determined for several wave-lengths. With exception of the Ochansk meteorite, all show an increasing reflection fi the violet to the red end of the spectrum; but otherwise there is no r tion to the different petrographical types. A rough division is made i the following colour groups, with the proportion of light reflected by ea

λ.	Black.	Dark.	Intermediate.	White.
400	0·06	0·12	0·26	0·32
650	0·08	0·20	0·31	0·41

L. J. S

Nininger (H. H.). *The composition of meteorites.* Journ. Geol. Chic 1938, vol. 46, pp. 889–891.

In estimates of the average composition of meteoritic material fal on the earth, it is suggested that undue weight has hitherto been gi to siderites and not sufficient to stones of various types. L. J. S

Buddhue (John Davis). *The oxidation of meteorites.* Popular As nomy, Northfield, Minnesota, 1939, vol. 47, pp. 93–97.

Partial analyses of iron-shale from the Willamette (and Odessa) s rites gave Fe_2O_3 81·81 (77·00), NiO 5·42 (5·56), loss at 110° C. 1·06 (1· ign. 8·74 (10·20), n.d. 2·98 (5·61), free metal 0·19 (1·03). As in prev analyses these contain less nickel than the original metal. 'Rustite' 'ayasite' are suggested as names for the rust of meteorites. Electrol action is suggested as one agent in the weathering of meteorites.

L. J. S

Lane (A. C.). *Meteorite contributions to sediment.* (Abstract.) Proc. G Soc. Amer., 1938 for 1937, p. 311.

Determinations of nickel in sediments might indicate the former p ence of meteorites. More nickel is found in deep-sea deposits than average in igneous rocks. Fossil meteorites would have more chanc preservation in beds of brown coal. L. J. S

La Paz (Lincoln). *Mathematical theory of the vertical distribution of meteorites.* Astron. Nachr., 1938, vol. 267, pp. 107–111, 1 fig.

A mathematical treatment, based on many assumptions, of amount of meteoritic material at various depths in the earth's surf [M.A. **6**–10.] L. J.

PAZ (Lincoln). *Distribution of the recognized meteorites of North America.* Bull. Geol. Soc. Amer., 1938, vol. 49, p. 1952. (Abstract.)
There is a lack of uniformity in the observed distribution. The con-tration of siderites in the southern Appalachians is attributed to ning activity in the gold placers; and to a less degree there is a con-tration of stones in the agricultural district of Kansas. L. J. S.

PLAN (Joseph). *Meteoritic dust and the production of metastable nitrogen molecules.* Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 43–46.
Certain bands in night-sky and auroral spectra are attributed to rogen made metastable by the surface action of meteoritic dust in the per atmosphere. L. J. S.

BANNES (Jean), DUFAY (Jean), & GAUZIT (Junior). *Le sodium atmosphérique.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 206, pp. 1525–1528, 1 fig.
The presence of the sodium D line in the spectrum of the night sky is ributed to meteoritic dust in the upper levels (above 130 km.) of the nosphere. M. H. H.

EK (Ernst). *Researches on the physical theory of meteor phenomena. III. Basis of the physical theory of meteor phenomena.* Publications de l'Observatoire Astronomique de l'Université de Tartu [Dorpat], 1937, vol. 29, no. 5, 69 pp. [Cf. M.A. **6**–400.]
A mathematical treatment of the flight of a small meteor in the upper nosphere without the formation of an air-cap. It is concluded that nucleus (up to 1 cm. radius) may become molten throughout and ay liquid drops. L. J. S.

NINGER (H. H.). *Sound from ether waves.* Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 97–99.
There are many reports that hissing and crackling noises have been ard at the same time that the light of a fireball was seen, while onations were heard some time afterwards. It is suggested that teors may be electrically charged and emit radio-waves, which on ching certain obstructions on the earth's surface may be transformed o sound-waves. For such sounds the term ethaerial (contraction of er and aerial) is suggested. L. J. S.

M[ILLMAN] (P. M.). *The origin of meteoric material.* Journ. Roy. Ast
Soc. Canada, 1938, vol. 32, pp. 304–308.

A criticism of A. Corin [M.A. 7–171]. Gravitational attraction is
sidered to be more effective than electrostatic. But meteorites are
dently fragments of larger masses, rather than accumulations of sma
masses. Although many telescopic meteors have interstellar velocit
this does not necessarily imply that meteorites reaching the earth h
come from interstellar space. L. J. S

URRY (W. D.). *Age determination of the iron meteorites.* Proc. Geol.
America, 1938, for 1937, p. 317. (Abstract.)

Determinations of U, Pb, and He in twenty-five siderites give a
ranging from 100 to 2900 million years, i.e. not older than the ear
suggesting that they are the debris of two planets of the solar syste
L. J. S

INGALLS (Albert G.). *Slicing and polishing meteorites.* Sci. Amer., 19
vol. 159, p. 120, 4 figs.

Illustrates the method employed at the United States National Muse
at Washington. For cutting, a toothless band-saw is charged w
carborundum. Polishing is done with fine carborundum. L. J. S

PANETH (F. A.). *The history of the name Widmanstätten: a few previou
unpublished facts.* Popular Astronomy, Northfield, Minnesota, 19
vol. 46, pp. 469–471.

Further argument in favour of the spelling Widmanstätten rat
than Widmanstetter, although the latter is quoted as the family na
under date 1596 and at the present time. [M.A. 7–63.] L. J. S

OWEN (E. A.). *Formation of Widmanstätten figures in meteorites.* Natu
London, 1938, vol. 142, pp. 999–1000.

Iron-nickel alloy (6–25 % Ni) when quenched from a high temperat
consists of a distorted body-centred lattice, which is supersaturated w
nickel and is in metastable equilibrium at ordinary temperatures. Fr
this condition kamacite as an undistorted α-lattice slowly grows
sheets parallel to the octahedral planes, and the excess of nickel beco
concentrated in taenite along the borders of the sheets. The lower

ıtent of nickel the thicker will be the kamacite sheets. [Cf. M.A. 390.] It is suggested that the heating takes place in the earth's atmo-ıere, and that the secondary growth took place at ordinary tempera-'es after[!] the fall of the meteorite. L. J. S.

ITH (S. W. J.) & YOUNG (J.). *Formation of Widmanstätten figures in meteorites.* Nature, London, 1938, vol. 142, p. 1162.

The narrow 'burnt zone' on the exterior of meteorites proves that mass was not heated throughout in the earth's atmosphere; and suggestion (preceding abstract) that the Widmanstetter structure leveloped after the fall of a meteorite is fallacious. L. J. S.

ITH (S. W. J.) & YOUNG (J.). *The Widmanstätten structure of octahedral meteoric iron.* Nature, London, 1939, vol. 143, pp. 384–385.

Taenite from the Butler (Missouri) siderite has a reversible magnetic nsition temperature at about 500° C., indicating the presence of about % Ni. The lattice parameters indicate 55 % in the narrowest bands, 50 % in the broader bands. Most of it has a single orientation with 1) parallel to the kamacite-taenite lamellae. Kamacite has 24 orienta-ns with (110) parallel to (111) of taenite and [001] at 4° to [01$\bar{1}$] of nite. Artificial Ni-Fe alloy with 10 % Ni when slowly cooled showed y the α body-centred phase; but on annealing at 580° also the γ face-tred phase containing about 30 % Ni, and showing the Widman-tter structure. L. J. S.

DFORD (R.). *The N'Goureyma meteoric iron.* Nature, London, 1938, vol. 142, pp. 1161–1162.

A fluidal arrangement shown by troilite nodules in this siderite was gested by E. Cohen (1903) to be due to the melting of the mass ing its passage through the air. A new section of the mass shows the al external alteration zone $\frac{1}{4}$–2 mm. in thickness; and any flow-ıcture in the interior must be earlier in origin. Mention is made of octahedrite which fell at Rembang, Java, on August 30, 1919, which ws a similar alteration zone. L. J. S.

RGE (Gerhard). *Metallurgical interpretation of structures found in meteoric irons.* Bull. Geol. Soc. Amer., 1938, vol. 49, p. 1948. (Abstract.) [M.A. 7–63.]

Gordón Morales (J.). *El hierro meteórico de Mallorca.* Bol. S
Española Hist. Nat., 1936, vol. 36, pp. 301–305, 2 pls.

This siderite [M.A. 7–66] fell at 11.35 a.m. on July 17, 1935, 8
from Palma in Mallorca [= Majorca]. The conical mass, with bl
fusion crust, weighs 809 grams, and 15 grams of fragments were
taken from the hole 90 cm. in depth. Sp. gr. 7·23–7·34. An etched
face shows Widmanstetter figures (width of kamacite lamellae
stated), and little troilite. Spectroscopic analysis showed Fe, Ni (< 8
Co, and Mn. L. J. S

Selivanov (L. S.). *The Kaïnsaz stony meteorite of 1937.* Compt. Re
(Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 263–264, 1 fig.

At 2.15 p.m. on September 13, 1937, a fireball with a short fiery
travelling towards the NW. was seen to burst, and a detonation
heard over a distance of 130 km. A smoky trail persisted for 10
minutes. Fifteen stones were found over an elliptical area 40 by 7 k
the largest of 102·5 kg. on the Kainsaz collective farm (55° 26′
53° 15′ E.), Muslyumov district, Tatar Republic, at the NW. end,
the smallest, nut-sized, near Kosteevo, at the SE. end of the elli
Other stones weighed 53, 27·5, 22 kg., and the total weight of 15 st
was over 200 kg. They have a black pitted crust, and inside are d
grey with a slight greenish tinge. They are slightly magnetic and
provisionally referred to the group of chondrites. L. J. S

Maliuga (L. P.). *The stony meteorite Kaptal-Aryk of 1937.* Cor
Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 265–266, 1

At 8.45 p.m. on May 12, 1937, a fireball, slightly reddish and
quantities of sparks, was seen for 2–3 seconds travelling E. to W
humming noise and a loud explosion were heard, and a bright
rapidly vanished. A stone of about 3½ kg. penetrated 60 cm. in
ground in the street of the village of Kaptal-Aryk (42° 27′ N., 73° 22′
Kalinin district, Kirghiz Republic. Three fragments weighing
grams were recovered. It has a pitted black crust ½ mm. thick,
inside shows a network of black veins and grains of nickel-iron.
classed as a veined chondrite. L. J.

Krinov (E. L.). *The stony meteorite Lavrentievka of 1938.* Compt. R
(Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 267–268, 2 figs.

At about 1.30 p.m. on January 11, 1938, three detonations were h
and a stone fell 18–20 metres from a hunter, making a hole 5 cm.

frozen ploughed ground, near Lavrentievka village (52° 37′ N., ° 34′ E.), Orenburg region. For ten minutes it was too hot to be ndled. The lens-shaped stone was broken by the fall, and five frag- nts weighing 793·6 grams were recovered and about 200 grams lost. has a brownish-black crust without pittings, and is a white chondrite h many chondrules and metal. L. J. S.

LIVANOV (L. S.), MALIUGA (D. P.) [*sic*], & KRINOV (E. L.). *Three meteoric falls in the U.S.S.R.* Nature, London, 1938, vol. 142, pp. 623–624, 3 figs.

See preceding abstracts. There are some discrepancies (misprints?) the two accounts. L. J. S.

RINOV (E. L.) *The Pavlodar stony meteorite.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 585–586, 1 fig.

A stone of 120 grams fell with a loud crash at 1.40 p.m. on May 23, 33, 1 metre from a man in the town square of Pavlodar [52½° N., ° W.] in Kazakstan, and was warm when picked up. Four fragments ighing in all 22½ grams have been received by the Meteorite Committee the Academy of Sciences. The dark-grey crust is smooth and 0·2 mm. ck on the rounded front of the stone, while on the back it is slaggy and mm. thick. The stone is a white chondrite with darker chondrules d minute drops of metal. The Pavlodar pallasite found in 1885 is now led Yamyshev [i.e. Yamysheva, Ямышева] in the U.S.S.R. list of teorites. L. J. S.

STAPOWITSCH (I. S.). *Meteorite falls in the U.S.S.R.* Nature, London, 1939, vol. 143, pp. 376–377.

Kukschin.—A meteorite was seen to fall from a cloudless sky, with a ar and whistling noise, at 2 p.m. on June 11, 1938, near the village ukschin (51° 3′ N. [?], 31° 50′ E.), 25 km. NW. of Nyezhin, Chernigov gion, Ukraine. A stone weighing 2250 grams penetrated dry soil to a pth of 30 cm.; it is grey inside. Two independent analyses gave SiO_2 ·40 (39.96), TiO_2 trace (0·018), Al_2O_3 2·21 (1·75), Cr_2O_3 0·54 (0·45), O 40·04 (46·23), NiO trace (1·85), MnO 0·003 (0·053), MgO 7·89 (6·22), O 2·51 (1·91), S 2·88 (2·77) [?].

'The *Zhovtnevyj* meteorite, khutor Pavlovka, Mariinsk district, alino region, Ukraine' [?], fell in the night of October 10, 1938. A ne of 30 kg., grey inside with metallic spangles, penetrated to a depth 70 cm. Fragments only were recovered. L. J. S.

Nininger (H. H.). *The Pantar, Lanao, Philippine Islands, meteor*
Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 5
580, 1 fig.

A meteor was seen and after 60 seconds explosions were heard, an
stone of 2320 grams was seen to fall in a rice-field. A photograph
given of the smoke-trail of the meteor. The small piece (16·8 gra
examined is a veined chondrite with metal and some troilite, and a
brownish-black crust $\frac{1}{10}$ mm. thick. In the darker coloured portion
chondrules break with the matrix, while in the lighter coloured port
the chondrules are not broken across on the fractured surface. Accord
to one account, small particles fell like rain on the metal roofs of hous

L. J. S

Nininger (H. H.). *A meteorite survey.* Scientific Monthly, New Yo
1938, vol. 47, pp. 136–143, 7 figs.

A popular account of the author's intensive search for meteorites
the middle west of the United States. Since 1923 eighty-four meteori
have been discovered, only two of which were witnessed falls. Search
localities of previously known falls also yielded further material. It
concluded that estimates of the amount of meteoritic material falling
the earth are too low. L. J. S.

Nininger (H. H.). *Meteorite collecting among ancient Americans.* Am
Antiquity, 1938, vol. 4, pp. 39–40, 2 pls.

Four new meteorites have recently been found on old Indian ca
sites in eastern Colorado and western Kansas. Previously kno
examples from ancient ruins are Casas Grandes, Huizopa, Anders
Hopewell Mounds, Navajo, Mesa Verde [M.A. **2**–391], Winona [M.
4–263], Pojoaque [M.A. **5**–12, 405], &c. It is suggested that a lo
out should be kept for meteorites when excavating ancient sites.

L. J. S.

La Paz (Lincoln). *The abnormal penetration of the Norfork, Arkans
iron.* Popular Astronomy, Northfield, Minnesota, 1938, vol.
pp. 523–524.

A calculation indicates that a siderite of 1050 grams would not pe
trate to a depth of 4 feet [M.A. **7**–69], suggesting that this was onl
fragment of a larger mass not found. L. J. S.

OOD (F. C.) & MERRITT (C. A.). *The Soper, Oklahoma meteorite.* Amer. Min., 1939, vol. 24, pp. 59–61, 2 figs.

An ataxite was found in 1938 on a farm 6 miles NW. of Hugo, Choc- w Co. (Soper is the address of the finder.) The pitted surface has a thin ick crust, only slightly weathered, suggesting a recent fall. A section ows a fine granular structure, which is finer in the outer portion, where e material is harder. The high phosphorus suggests that some of the ains are schreibersite. Analysis by S. G. English gave Fe 90·89, Ni 6·21, 0·70, Al 0·10, P 2·23, S 0·03, C 0·02, Cl trace, insol. 0·07 = 100·25; gr. 7·387. L. J. S.

ILSON (Ben Hur). *The Benld meteorite (Illinois, no. 2).* Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 548–558, 6 figs. Science, New York, 1939, vol. 89, pp. 34–35. Mineralogist, Portland, Oregon, 1939, vol. 7, no. 1, pp. 5–6, 18–22, 4 figs.

A roar and a crash were heard at about 9 a.m. on September 29, 1938, Benld (39° 5′ 14″ N., 89° 48′ 52″ W.), Macoupin Co., and afterwards was found that a meteorite had broken through the roof of a garage d a motor-car. The line of direction of the holes made was 12° 29′ to vertical. The stone weighed about 4 lb. (1770·5 grams after two all pieces had been detached). It has a velvety black crust $\frac{1}{2}$–1 mm. ick, and the interior is dark grey with well-developed chondrules and cks of metal. Sp. gr. 3·69. This is the second meteorite known from inois. L. J. S.

EN (V. B.). *The Maria Elena meteorite.* Amer. Min., 1938, vol. 23, pp. 661–664, 2 figs.

This siderite weighing 15½ kg. was presented in 1935 to the United tes National Museum by the manager of the Maria Elena works, tofagasta, Chile. When and where found not known. It is a fine ahedrite with abnormally low nickel: Fe 94·93, Ni 4·76, Co 0·131, 0·010, P 0·052, S 0·029, C 0·007, Pt &c. nil = 99·92; sp. gr. 7·74. L. J. S.

NINGER (H. H.). *Observations and suggestions regarding meteorite craters.* Bull. Geol. Soc. Amer., 1938, vol. 49, p. 1956. (Abstract.)

It is suggested that there may be different types of meteorite craters, d that some may be elliptical in outline. [M.A. 7–77.] L. J. S.

Nininger (H. H.). *Odessa meteorite crater.* The Sky, Amer. Mus. N
Hist., 1939, vol. 3, no. 4, pp. 6–7, 23, 7 figs.

A popular account of four visits, one by air, to the meteorite cra
near Odessa in Texas. With a magnetic balance 27 pieces of me
(1–64 oz.) were located at depths up to 7 inches below the surface.
partly embedded mass of $8\frac{1}{4}$ lb. was also found. [M.A. **4**–427; **5**–16, 3(
6–17, 105.] L. J. S

Lundberg (Hans). *Some geophysical data on the meteor crater*
Arizona. Bull. Geol. Soc. Amer., 1938, vol. 49, p. 1953. (Abstra

Magnetic anomalies indicate the presence of fragmentary meta
material in shattered ground south of the crater. [M.A. **5**–302.]
L. J. S

Reinvald (I.). *The finding of meteoric iron in the Estonian craters.* 1
Sky, Amer. Mus. Nat. Hist., 1938, vol. 2, no. 6, pp. 6–7, 28–
4 figs. [Cf. M.A. **7**–73; Min. Mag. **25**–75.]

Melton (Frank A.). *Geologic theories on the origin of the Carolina "bay*
(Abstract.) Proc. Geol. Soc. Amer., 1938, for 1937, p. 312.

The suggestion that the 'bays' were formed by wind action is
supported. [M.A. **6**–16.] L. J. S

Melton (Frank A.). *Possible late Cretaceous origin of the Carol*
"bays". Bull. Geol. Soc. Amer., 1938, vol. 49, p. 1954. (Abstra

The best-developed 'bays' are on Cretaceous rocks. L. J. S

Prouty (W. F.). *Later evidence concerning meteoritic origin of Carol*
"bays". (Abstract.) Science, New York, 1938, vol. 88, pp. 475–4

High magnetic spots are associated with the larger and medium-si
'bays'. The 'bays' show no relation to topography or rock charac
[M.A. **7**–76.] L. J. S

Fairchild (Herman L.). *Selenology and cosmogeology. Cosmic and g*
logic import of the lunar features. Science, New York, 1938, vol.
pp. 555–562.

A comparison of the craters on the moon with the meteorite crate

zzona [M.A. **4**–428] is made in support of T. C. Chamberlin's planetesi-l hypothesis of the origin of the planets and their satellites, which are pposed to have grown by the cold accretion of planetesimals. The oxidized and unhydrated planetesimal stuff of the moon is called nite'. L. J. S.

ANZ (Walter). *Beitrag zum Köfels-Problem: die „Bergsturz-Hebungs- und Sprengtheorie"*. Neues Jahrb. Min., Abt. B, 1938, Beil.-Bd. 80, pp. 113–118, 2 pls., 6 text-figs. [Cf. M.A. **6**–401; **7**–75.]

Description of the fragmentary materials. Accompanying a magmatic rusion, a volcanic gas explosion is suggested. L. J. S.

IDE (F.). *Nickel im Bimsstein von Köfels*. Naturwiss., 1938, vol. 26, p. 495.

Spectroscopic analysis of the 'pumice' of Köfels [M.A. **6**–401; **7**–75] wed 0·001 % NiO, and about the same amount was found in glass m the Nördlinger Ries [M.A. **7**–74]. This is less than the average ount of NiO (0·01 %) present in igneous rocks, and its presence is no pport for the meteoritic origin. L. J. S.

PAZ (Lincoln). *The great-circle distribution of the tektites*. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 224–230.

A mathematical discussion of the probability of tektites falling on a at circle of the earth [M.A. **3**–538; **6**–106]. To accommodate later ds a second great circle, 'the Lacroix-Spencer great circle', is assumed. L. J. S.

OOMANS (Cath. M.). *On tektites and pseudo-tektites from Dutch East Indies and Philippines*. Leidsche Geol. Meded., 1938, vol. 10, pp. 63–81, 8 figs.

In addition to the following analyses of tektites, analyses are given of eudo-tektites from Patagonia and the Philippine Islands (pseudo-ericanites) [M.A. **6**–403] and of obsidian pebbles from Java and matra. The surface sculpture on the pseudo-tektites is much the same on tektites, and is due to corrosion in the soil. Tektites are completely assy, while pseudo-tektites often contain crystallites. The composition tektites is compared with sedimentary rocks (suggesting a terrestrial

origin) [M.A. **5**–304], whilst that of pseudo-tektites is compared w igneous rocks.

	SiO_2.	TiO_2.	P_2O_5.	Al_2O_3.	Fe_2O_3.	Fe(
I. Kaliosso, Java	70·62	0·62	0·12	12·34	2·25	3·1
II. Dhupan Hill, Siam ...	72·40	0·74	0·14	12·68	0·23	3·5
III. Busuanga, Philippines ...	71·32	1·04	0·13	12·16	2·03	3·0
IV. Bulakda, Philippines ...	71·20	0·92	0·10	13·52	0·59	3·8
V. Rizalite: Philippines ...	70·66	0·63	0·18	12·08	1·78	4·5

	MnO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O+.	Total.	Sp. gr.	*n*.
I.	0·10	3·61	2·99	1·68	1·57	0·75	99·82	2·442	1·5
II.	0·06	2·34	2·75	1·68	3·16	0·43	100·20	2·409	1·5(
III.	0·11	2·94	2·95	1·66	1·90	0·51	99·78	2·431	(1·5)
IV.	0·08	2·23	3·40	1·59	1·84	0·63	99·99	2·436	(1·5)
V.	0·16	3·65	2·97	1·62	1·69	0·15	100·09	2·439	(1·5)

L. J. S.

Heide (F.). *Über Tektite von Siam.* Zentr. Min., Abt. A, 1938, pp. 3 360.

A rounded black tektite, weighing 4·5 grams, from Bo Ploi, 200 k NW. of Bangkok, contains NiO 0·006 %. Tektites from a central a (Billiton, Borneo, Cambodia, Cochin China) contain NiO 0·02–0·04 whilst those from an outer zone (western Siam, northern Indo-Chi Philippines, Australia) contain 0·001–0·006 %. [M.A. **6**–108, 402.]

L. J. S.

Heide (F.). *Über Tektite von den Philippinen.* Zentr. Min., Abt. A, 19 pp. 289–293, 7 figs.

The tektites described (exact locality not known) are dull black w the dull surface corroded with grooves and pits. Thin splinters are bro and isotropic. Sp. gr. 2·442, n_{Na} 1·5113. Analysis by P. Wagner: Si 71·45, TiO_2 1·02, Al_2O_3 12·54, Fe_2O_3 0·51, FeO 4·61, MnO 0·10, MgO 2· CaO 2·82, Na_2O 1·44, K_2O 2·41, P_2O_5 0·38, H_2O+ 0·24, H_2O- 0·04 100·28. Spectroscopic analysis showed also Ni, Cr, Sr, Ba, Zr, V, Cu, C

L. J. S.

Fenner (Charles). *Australites, Part III. A contribution to the origin tektites.* Trans. Roy. Soc. South Australia, 1938, vol. 62, pp. 1 216, 2 pls., 3 text-figs. [Cf. M.A. **6**–18, 208; **7**–78.]

Some additional facts concerning the forms and distribution australites, and further comparison with the smoke-bombs from railw engines. An evolution of the form is suggested from glass spheres trav ling through the earth's atmosphere; it being supposed that th

eres represent the 'residual incombustible siliceous content' shed m a 'widespread swarm of combustible metallic meteorites'. In a liography of 125 items, arranged chronologically, the first entry under e 1787 is attributed to A. Dufrénoy [1792–1857]! L. J. S.

MPEL (K.). *Zur Entstehung der Tektite.* Gerlands Beitr. Geophysik, 38, vol. 54, pp. 21–28.

The acceptance of the meteoritic hypothesis is a shelving, rather than olution, of the tektite problem. None of the several terrestrial and mic hypotheses of their origin agrees with the author's three [false] tulates that tektites (1) belong to the Quaternary ice age, (2) are of rld-wide distribution, and (3) are all identical in chemical composition. attempt is made to correlate tektites with palaeoclimatology and rophysics. Ice ages have been attributed to a periodic variability of sun (compared with novae stars): a period of maximum activity ducing more intense commotion and aqueous precipitation in the th's atmosphere. During such a period nebulous material was pro- ed by the solar prominences, and meeting the earth's atmosphere the er part, consisting of hydrogen, gave rise to clouds, while the re- nder produced tektites. Geologists are recommended to search for tites in glacial deposits of the Upper Carboniferous period.

L. J. S.

SS (Hans). *Bemerkungen zum Meteoritenproblem: die Radioaktivität das Kaliums als Mittel zur Bestimmung des relativen Alters der Elemente.* Naturwiss., 1938, vol. 26, pp. 411–412.

The isotope ratio $^{39}K : {}^{40}K$, which is readily determined owing to the dioactivity of ^{40}K, serves as an age-measure of the element in meteor- and tektites. Preparations of KCl from tektites from Indo-China, stralia, Moravia, and the Philippine Islands showed the same activity terrestrial KCl. Hence the elements of tektites and of the earth are the same age, and either tektites originated within the solar system, the matter of the whole galaxy is coeval. M. H. H.

Chemical Crystallography.

ERGER (M. J.) & BLOOM (M. C.). *Crystal polymorphism.* Zeits. Krist., 1937, vol. 96, pp. 182–200, 2 figs.

An outline is given of the history of theories advanced to account for occurrence of polymorphism and of the existing state of knowledge.

The authors then consider what fundamental property of crystall matter calls forth different forms of the same chemical substance a causes the appearance of discontinuous jumps in physical properties definite transformation points, suggesting an answer based on potential energy of the various configurations. H. S

Bloom (M. C.) & Buerger (M. J.). *On the genesis of polymorphous for —Sb_2O_3.* Zeits. Krist., 1937, vol. 96, pp. 365–375, 1 fig.

When the precipitation of a solid from solution takes place the pr ence of certain impurities will often cause the appearance of an unsta modification which can only be made to pass into the form stable at temperature of the experiment by complete removal of the impurity. the case of Sb_2O_3 the presence of chloride and sulphate cause the appe ance of orthorhombic valentinite instead of the cubic senarmont which is stable below 573° C. Perchlorate has a comparatively fee effect. H. S

Tiemeyer (R.). *Über den Ablauf polymorpher Umwandlungen bei A moniumnitrat, NH_4NO_3.* Zeits. Krist., 1937, vol. 97, pp. 386–4 14 figs.

Ammonium nitrate exists in five modifications: hexagonal, t orthorhombic, tetragonal, and cubic; the transition temperatures be 16°, 32·5°, 84·5°, 125° C. By the aid of Laue diagrams the author tra the transformations of the modifications (excluding the hexagon into one another as the temperature rose or fell. H. S

Meyer (Wilhelm Fr.). *Untersuchungen an Kobalt und im System Kob Kohlenstoff.* Zeits. Krist., 1937, vol. 97, pp. 145–169, 5 figs.

Vapour-pressure and temperature curves are given to explain mechanical and thermal transformations of the hexagonal and cu modifications of cobalt into each other. Mixed crystals are formed about 230–270° C. on heating cobalt with coal-gas. They are unsta at ordinary temperatures. At 500–800° C. a stable cobalt carbide Co analogous to Fe_3C, is obtained by treatment with coal-gas or benzo H. S

Wyart (Jean). *Sur un cas de polymorphisme par passage progressif d arrangement cristallin à un autre plus symétrique, observé su leucite.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205, pp. 1077–10

The changes with temperature of the *a* and *c* unit-cell dimension

ite were followed. At 625° they become equal (13·40 Å.), and the tal cubic, which it apparently continues to be at higher temperatures, t 750° $a = c = 13{\cdot}45$ Å. The change is accompanied with absorption eat, which is evolved as the crystal cools and the reverse transforma- occurs, with no hysteresis. C. A. S.

JI (Hiroroku). *On the change of lattice-orientation due to allotropic transformation in boracite, leucite and anhydrous sodium sulphate crystals.* Sci. Rep. Tôhoku Univ. Sendai, Ser. 1, 1937, vol. 26, pp. 86–92, 6 figs.

-ray photographs of boracite and leucite at room-temperature and ve the transition-point (265° and 620° C. respectively) show that the) planes of the cubic lattice are parallel to the (110) planes of the do-cubic lattice. Na_2SO_4, orthorhombic (pseudo-hexagonal) at -temperature, changes to hexagonal at 280° C., the (0001) planes g the same in both. The change in orientation on the inversion α- iron is also discussed. L. J. S.

DLING (Florrie M.) & MELLOR (D. P.). *A note on $BaCdCl_4.4H_2O$ and its suggested isomorphism with $BaPt(CN)_4.4H_2O$.* Zeits. Krist., 1937, vol. 97, pp. 522–523.

he authors consider that habit, cleavage, optical properties, &c., all t to the non-isomorphism of $BaCdCl_4.4H_2O$ and $BaPt(CN)_4.4H_2O$. H. S.

SSEUR (H.) & RASSENFOSSE (A. de). *Note sur l'isomorphisme du $BaCdCl_4.4H_2O$ et du $BaPt(CN)_4.4H_2O$.* Zeits. Krist., 1938, vol. 98, pp. 353–355.

reply to criticisms made by F. M. Quodling and D. P. Mellor [pre- g abstract] on the suggested isomorphism of $BaCdCl_4.4H_2O$ and $t(CN)_4.4H_2O$. [M.A. **6**–42.] H. S.

ERT (H.). *Die anomalen Mischkristalle. Teil III.* Fortschr. Min. Krist. Petr., 1937, vol. 22, pp. 185–488, 28 figs.

his third part concludes a voluminous report (516 pp., 68 figs.) on malous mixed crystals [M.A. **6**–463]. An extensive bibliography s 774 titles. L. J. S.

RSMAN (A. E.)] Ферсман (А. Е.). Периодический закон Менделеева в геохимии.—FERSMAN (A. E.). *La loi périodique de Mendeléev et*

son application à la géochimie. Труд. Юбил. Менделеевского Съе (Trav. Congrès Jubilaire Mendeléev), Leningrad, 1936, vol. pp. 383–417 (Russian), pp. 419–454 (French).

The French translation of the paper read before the Mendeleev C gress in September 1934 gives a brief, but adequate, summary of author's leading views on the subject of geochemistry. The distribut and migration of chemical elements are discussed on the basis of periodic table and an attempt is made to correlate the distribution migration of elements with their properties. S. I. T

[Kapustinsky (A. F.)] Капустинский (А. Ф.). Равновесие физи химических сил в кристаллической решетке. [*The equilibrium physico-chemical forces in a crystalline lattice.*] Химические ра весия в неорганических системах. [*Chemical equilibria in inorg systems.*] Труд. Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Tr All-Union Sci. Research Inst. Econ. Min.), 1936, no. 109, pp. 5- 3 figs.

From the second principle of crystal-chemistry [M.A. **5**–456] the lowing relations are deduced: the specific heat $C_v = 3/2U\alpha$ (U cry lattice energy, α coefficient of thermal expansion), the temperatur fusion $T_s = 0{\cdot}074\ U/C_v$. A set of equations determining the positio the eutectic point in a binary system is given. S. I. T

Herlinger (E.). *Morphotropische Beziehungen zwischen den Modi tionen von Kieselsäure und den Feldspatstrukturen.*—Герлингер (Морфотропические отношения между модификациями кремне и полевошпатовыми структурами. Изв. Акад. Наук СССР., Мат. Ест. Наук, Сер. Геол. (Bull. Acad. Sci. URSS, Cl. Sci. M Nat., Sér. Géol.), 1937, pp. 107–136, 28 figs. (German), pp. 154 (Russian).

The structure of silicates is discussed and the connexion between modifications of silica, felspars, and other silicates is explained from point of view of fundamental laws of crystal-chemistry: close pack co-ordination numbers, and the relative positions of SiO_4 tetrahed S. I.

[Belyankin (D. S.) & Feodotiev (K. M.)] Белянкин (Д. С Феодотьев (К. М.). К вопросу о дегидрации гипса.—Beljan (D. S.) & Feodotiev (K. M.). *On the question of dehydratatio*

gypsum. Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, no. 6, pp. 453–461, 4 figs. (Russian with English summary.)

pecimens of gypsum from Sicily, Ohio, and Caucasus were studied. thermal curve shows two terraces corresponding to the transitions $O_4.2H_2O \rightarrow CaSO_4.\frac{1}{2}H_2O \rightarrow CaSO_4$. The dehydration curve shows e intervals: (1) from ordinary temperature to 70° C.; (2) from 70° to (hemihydrate); and (3) from 90° to 200° (soluble anhydrite). The ical data are: hemihydrate α 1·530, γ 1·542; soluble anhydrite α 1·544, 555. The existence of definite hemihydrate and soluble anhydrite is tulated. [Cf. M.A. **4**–85, **5**–451–2.] S. I. T.

RCHIJS (Louis). *Over het tetragonale, enantiomorfe nikkelsulfaat met 5 aq.* Natuurwetensch. Tijdschrift, 1937, vol. 19, pp. 115–148, 2 pls., 10 text-figs. (Flemish with French résumé).

rystals of $NiSO_4.6H_2O$ grown at 38–40° are 60 % right-handed and left-handed; but grown in laevo-polarized light with a Wood's only right-handed crystals are formed. The rotatory power $[\alpha]_D$ is per mm. The etch-figures afford a ready means of distinguishing t- and left-handed crystals. The unit cell has dimensions a 6·776, ·249 Å. L. J. S.

CHELL (A. N.). *The optic properties of Seignette and related salts.* Amer. Min., 1937, vol. 22, pp. 1088–1093, 8 figs.

ublished data are plotted on graphs. L. J. S.

SUBARA (A.) & UKAWA (H.). *On the chemical formula of chalcopyrite.* Mem. Coll. Sci. Kyoto Univ., Ser. B, 1938, vol. 14, pp. 61–72.

ith chalcopyrite electrodes in dilute H_2SO_4 only iron goes into solu- . Determinations were also made of the molecular weight by the oscopic method in molten Sb_2S_3, and of the action of hot HCl gas and d NaOH. All methods indicate that both Cu and Fe are divalent that chalcopyrite is a monomolecular compound $CuFeS_2$ or a double CuS.FeS. L. J. S.

BER (Willi). *Zur Kristallmorphologie von Ammoniumazid, $NH_4.N_3$.* Zeits. Krist., 1937, vol. 96, pp. 386–389, 4 figs.

mmonium azide forms orthorhombic crystals with ratios $a:b:c =$ 8:1:1·056. H. S.

Artificial Minerals.

Michel-Lévy (Albert) & Wyart (Jean). *Utilisation des hautes temp tures et des hautes pressions réalisées dans la détonation d'explo pour la reproduction artificielle de minéraux: zincite et willém* Compt. Rend. Acad. Sci. Paris, 1938, vol. 206, pp. 261–263.

Crystalline zincite was formed when hexogene was exploded in a b tube enclosed in a steel bomb, and the whole heated in an elec furnace at about 400° for some days. The estimated temperature pressure was 4000° and 4000 kg. per sq. cm. With the addition of cipitated silica acicular willemite was produced. L. J. S

Michel-Lévy (Albert) & Wyart (Jean). *Synthèse de l'orthose et l'a par pneumatolyse à l'aide d'explosifs brisants.* Compt. Rend. A Sci. Paris, 1939, vol. 208, pp. 293–294.

Hexogene was exploded in a bomb containing precipitated SiO_2 Al_2O_3 with K_2CO_3 or Na_2CO_3 and the whole heated for some day about 550°. The scoriaceous crust so formed contained spherulite orthoclase or albite. L. J. S

Gaudin (A. M.) & McGlashan (D. W.). *Sulphide silver minerals contribution to their pyrosynthesis and to their identification by s tive iridescent filming.* Econ. Geol., 1938, vol. 33, pp. 143– 36 figs.

Ag, As, &c., were fused with excess of sulphur in sealed iron pipes, diagrams are given for the systems Ag–As–S, Ag–Sb–S, Ag–Bi–S, Ag–Cu–Sb–S. Silver minerals synthesized are argentite, prous smithite, miargyrite, matildite, stromeyerite, and perhaps also pearc stephanite, polybasite, and tapalpite ($3Ag_2S.Bi_2S_3$?). Other mine obtained are stibnite, bismuthinite, galena, chalcosine, covelline, cha stibite, tetrahedrite, enargite, and famatinite. No chemical analyses given, and the identification of the minerals depends on the irides films produced on polished sections by the action of iodine and H_2SO methyl alcohol. Photomicrographs show complex eutectic intergrow L. J. S

Kurnakov (N. N.), Kornilov (I. I.), & Borky (G. B.). *On "ruby recrement of aluminothermal production of metallic chromium.* Co Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 18, pp. 583–584, 1

A dark red crystalline slag is formed in the manufacture of chrom

al by the thermite process in Georgia from Cr_2O_3 and Al powder with ue $KClO_3$ and CaO. Cavities in the slag contain hexagonal plates of undum with the forms *c r* and rarely *a*; ω 1·770, ϵ 1·762. Analysis of stals gave Al_2O_3 (88·40), Cr_2O_3 7·57, Fe_2O_3 0·10, MgO 0·73, CaO) = 100·00. They do not fluoresce in ultra-violet rays, but the dark colour is changed to light red (carmine). L. J. S.

TTLER (E.) & KÖHLER (A.). *Neue Beiträge zur Cordieritsynthese.* Zentr. Min., Abt. A, 1938, pp. 149–159, 3 figs.

fusion of appropriate mixtures at 1400–1500° C. followed by slow iling yielded crystals of magnesium-cordierite. The best crystals have composition $2MgO.2Al_2O_3.5SiO_2$. These are pseudo-hexagonal sms (10×6 mm.) in six sectors, with $2V_x$ 50–57° parallel to the out- es (100), α' 1·524. Crystals with the composition $MgO.Al_2O_3.3SiO_2$ w twelve sectors with outlines (010) (interpenetration trillings) and 65–78°, α' 1·526. Crystals $3MgO.3Al_2O_3.8SiO_2$ are smaller and less fect; α' 1·526. Attempts to prepare pure iron-cordierite at 1400– 0° C. were unsuccessful, the material breaking down to magnetite, nel, and sillimanite. But small crystals with the composition lg,Fe)O.$2Al_2O_3$.$5SiO_2$ containing 25, 50, and 75° of iron-cordierite re obtained, together with magnesium-cordierite; these have 2V about . α' 1·526. All these cordierites are optically negative. In these melts nel and sillimanite are of earlier formation than the cordierite. The tions of these minerals in igneous and metamorphic rocks are dis- sed. L. J. S.

INT (Einar P.), MCMURDIE (Howard F.), & WELLS (Lansing S.). *Formation of hydrated calcium silicates at elevated temperatures and pressures.* Journ. Res. Nat. Bur. Standards U.S.A., 1938, vol. 21, pp. 617–638, 6 pls., 2 text-figs. (Research Paper RP1147.)

X-ray study showed the following minerals to be definite compounds: enite, $CaO.2SiO_2.2H_2O$; gyrolite, $2CaO.3SiO_2.2H_2O$; crestmoreite, $aO.2SiO_2.3H_2O$; xonotlite, $5CaO.5SiO_2.H_2O$; afwillite, $3CaO.2SiO_2$. $_2O$; foshagite, $5CaO.3SiO_2.3H_2O$; and hillebrandite, $2CaO.SiO_2.H_2O$. ntrallassite and truscottite are identified with gyrolite, and river- eite with crestmoreite. In an autoclave with inside filtering device y gyrolite, xonotlite, and foshagite were obtained artificially. Other npounds prepared were: cristobalite, wollastonite, pseudo-wollaston- β-$3CaO.2SiO_2$, $4CaO.5SiO_2.5H_2O$, $CaO.SiO_2.H_2O$, $2CaO.SiO_2.H_2O$, $CaO.5SiO_2.6H_2O$, and $3CaO.SiO_2.2H_2O$. L. J. S.

Larsen (Esper S.) & Bridgman (P. W.). *Shearing experiments on s selected minerals and mineral combinations.* Amer. Journ. Sci., 1 ser. 5, vol. 36, pp. 81–94.

A pair of thin disks of finely powdered minerals was compres by steel pistons on either side of an anvil. Under pressures up 50,000 kg./cm.^{2} at room-temperature the anvil was rotated. In attempt to form 'stress minerals', mixtures of orthoclase, halloysite, (of the composition of sericite), chlorite, sericite, &c. (to give biotite), various other minerals were tested. Optical and X-ray examinatio the materials suggest some chemical changes, but no metamorp 'stress minerals' were formed. L. J. S

[Grigoriev (D. P.)]. Григорьев (Д. П.). Синтез и исследова биотита. Докл. Акад. Наук СССР, 1938, vol. 20, pp. 391–3 Grigoryev (D. P.). *Synthesis and investigation of biotite.* Compt. Re (Doklady) Acad. Sci. URSS, 1938, vol. 20, pp. 391–393.

Mg-Fe-micas previously obtained artificially are classed by the aut as fluor-phlogopite and fluor-meroxene [M.M. **24**–610]. Fluor-biot $F_2K(Mg,Fe'')_3AlSi_3O_{11}$ with FeO:MgO = 2:1, was obtained by fusin mixture with excess of NH_4F at 1450°. The brownish-black sc (4 sq. mm.) have α 1·551, γ 1·596, with pleochroism α colourless, β an brown. L. J. S

Koch (Leo). *Schlackenforschung als Grundlage der Erforschung petr gischer Probleme. I. Teil. Entwicklung und methodische Grundlag* Fortschr. Min. Krist. Petr., 1936, vol. 20, pp. 196–238.

A historical review is given of the study of slags especially in relat to petrological problems. A bibliography of 134 items is append [M.A. **5**–453.] L. J. S

[Lapin (V. V.)] Лапин (В. В.). К петрографии ферро-хромовых ферро-вольфрамовых шлаков.—Lapin (V. V.). *On the petrogra of the ferro-chromium and ferro-tungsten slags.* Труд. Петр. Ин Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 19 no. 11, pp. 127–143, 17 figs. (Russian with English summary.)

Gravitational differentiation is invoked to explain the accumulat of magnesium-chromium-spinel in the lower part of a ferro-chromi

composed of spinel (n 2·035), melilite (ω 1·640, ϵ 1·644), and $CaO.SiO_2$ (α' 1·712, γ' 1·728, 2V 73°). Another slag showed very good rgrowths of monticellite (α 1·645, γ 1·680, 2V 87°, negative) and oxene (α 1·691, γ 1·719, $\gamma:c=44°$, 2V 69°, negative). Several analyses lags and minerals are given. S. I. T.

PIN (V. V.)] Лапин (В. В.). К петрографии богатых марганцем (тефроитовых) шлаков.—LAPIN (V.). *On the petrography of the rich in manganese (tephroite) slags.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 13, pp. 225–239, 6 figs. (Russian with English summary.)

rom manganese-rich slags the following minerals are described: hroite, γ- and β-$2CaO.SiO_2$, melilite, manganosite (n 2·23), manganese-el, and glass. [Cf. M.A. **7**–142.] S. I. T.

PIN (V. V.)] Лапин (В. В.). Ликвация силикатного расплава в металлургическом шлаке.—LAPIN (V.). *Liquation of the silicate melt in metallurgical slag.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 13, pp. 247–274, 4 pls., 5 text-figs. (Russian with English summary.)

slag from a ferro-molybdenum furnace, after deduction of certain des corresponding to small amounts of metal and sulphides, gave on lysis SiO_2 80·98, TiO_2 0·11, Al_2O_3 3·69, Cr_2O_3 0·06, FeO 2·21, MnO 0, MgO 1·03, CaO 7·80, Na_2O 0·23, K_2O 0·58, F 1·81, ign. 0·83, H_2O- = 100·00. This slag is in the form of an emulsion composed of two ssy phases: (1) acid, n 1·467, and (2) basic, n 1·580. As a rule, minute bules of basic glass are enclosed in the larger globules of the acid glass, ich in their turn are enclosed in a groundmass of basic glass. Fluidal ture is also observed. Other samples of this slag show various stages crystallization with the formation of cristobalite (α 1·484, γ 1·487) in acid glass, and of pyroxene (α 1·693, γ 1·719, $\gamma:c=42°$) in the basic ss, until an almost holocrystalline slag is reached. In its composition slag falls within the boundaries of the coexistence of two liquid ses as established by J. W. Greig [M.A. **3**–289], and it is inferred that have here an example of liquation at high temperature. Other cases iquation differentiation in artificial melts and magmas are discussed. M.A. **7**–33.] S. I. T.

[Belyankin (D. S.) & Ivanov (B. V.)] Белянкин (Д. С.) и Иван (Б. В.). Химико-минералогическая характеристика одно магнезитового кирпича с Мариупольского завода им. Ильича.— Beliankin (D. S.) and Ivanov (B. V.). *Chemico-mineralogic characteristic of one magnesite brick from the Mariupol works.* Тру Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. S URSS), 1937, no. 11, pp. 111–126, 10 figs. (Russian with Engli summary.)

A used magnesite brick from a Martin furnace shows the followi zones: (1) brown unaltered zone with 90 % periclase and 10 % silicat and oxides of iron; (2) brown with light spots transition zone with 16 silicates (mainly monticellite); (3) light grey zone with 20 % silicat (mainly monticellite); (4) greyish-black zone with 33 % silicates (main forsterite); (5) magnesite fettling with 52 % silicates (mainly forsterit The migration of oxides in the brick is discussed and five chemic analyses are given. S. I. T.

[Belyankin (D. S.) & Korchemkin (L. I.)] Белянкин (Д. С.) и Ко чемкин (Л. И.). Об одном Уральском мартеновском шлаке и кристаллизации в нем минерала мервинита.—Beliankin (D. S and Korchemkin (L. I.). *On the crystallization of merwinite in o Ural slag from the Martin's furnace.* Труд. Петр. Инст. Акад. Ha CCCP (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 12, p 203–212, 4 figs. (Russian with English summary.)

Tabular crystals of merwinite were found lining a cavity in a Mart furnace slag composed of monticellite, gehlenite (ϵ 1·656, ω 1·661), a spinel (n 2·14). Merwinite gave on analysis (average of two): SiO_2 31·3 TiO_2 0·86, Al_2O_3 5·94, Fe_2O_3 7·28, FeO nil, MnO 5·66, MgO 11·20, Ca 36·25, Na_2O 1·48, K_2O 0·18, ign. 0·04 = 100·22. The analysed specim contains about 15 % spinel. It is characterized by two sets of polysy thetic twin-lamellae intersecting at 42°; α 1·705, β 1·711, γ 1·724, 2 75°, positive. S. I. T.

[Belyankin (D. S.) & Shumilo (I. M.)] Белянкин (Д. С.) и Шуми (И. М.). О минералогическом составе одного марганцовисто шлака.—Beliankin (D.) and Shumilo (I.). *On the mineralogic composition of one manganese containing slag.* Труд. Петр. Ин Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 193 no. 13, pp. 241–246, 2 figs. (Russian with English summary.)

The following were separated from a manganese-rich slag: manganes

l (anal. I) sp. gr. 3·98, n 1·79; calcium aluminate (II), monoclinic (?), 117, γ 1·652, 2V 10°, positive, $\gamma:c = 37°$; manganese aluminate (III), r. 3·68, α 1·691, γ 1·711. The X-ray analysis of the last gave a 5, Å. It shows a resemblance to β-Al_2O_3.

SiO_2.	Al_2O_3.	Fe_2O_3	FeO.	MnO.	MgO.	CaO.	BaO.	Ign.	Total.
—	61·41	—	0·28	32·28	4·10	1·92	—	—	99·99
1·10	76·00	0·85	—	0·67	0·40	20·20	—	—	99·22
0·16	74·70	—	0·29	14·22	3·08	—	4·52	0·03	97·00

S. I. T.

rvinkin (O. K.) & Popova (T. A.)] Ботвинкин (О. К.) и Попова (Т. А.). Диаграмма плавкости системы Na_2SiO_3–Mg_2SiO_4–SiO_2. [*The melting diagram of the system* Na_2SiO_3–Mg_2SiO_4–SiO_2.] Труд. Второго Сов. Экспер. Мин. Петр., 7–10 мая 1936г., Акад. Наук СССР [Trans. Second Confer. Exper. Min. Petr., 7–10 May 1936, Acad. Sci. USSR], 1937, pp. 87–93, 1 fig.

uilova (N. S.)] Мануйлова (Н. С.). Кристаллические фазы в системе Na_2O–MgO–SiO_2. [*Crystalline phases in the system* Na_2O–*MgO*–SiO_2.] Ibid., pp. 96–101, 6 figs.

he thermal diagram of the ternary system Na_2SiO_3–Mg_2SiO_4–SiO_2 is n in the first paper, while the minerals there recorded are described e second paper. Besides cristobalite, sodium mono- and disilicate, erite, and enstatite, the following new crystalline phases are ribed: $Na_2O.MgO.SiO_2$ (cubic, n 1·523); $Na_2O.2MgO.2SiO_2$ (mono-, α 1·641, γ 1·654, $\gamma:c = 38°$, 2V large, positive); $Na_2O.2MgO.$ $_2$ (monoclinic, α 1·540, γ 1·546, $\gamma:c = 24°$, 2V large, positive).

S. I. T.

ig (J. W.) & Barth (Tom. F. W.). *The system,* $Na_2O.Al_2O_3.2SiO_2$ (*nephelite, carnegieite*)–$Na_2O.Al_2O_3.6SiO_2$ (*albite*). Amer. Journ. Sci., 1938, ser. 5, vol. 35 A, pp. 93–112, 2 figs.

he equilibrium diagram of this system is similar to that of nepheline–thite (N. L. Bowen, 1912). The melting-point at normal pressure lbite is 1118°. Nepheline inverts to carnegieite at 1249–1259°, rising the amount of albite in solid solution; carnegieite melts at 1526°. eutectic with 76 % albite has m.p. 1068°. Jadeite ($Na_2O.Al_2O_3.$ $_2$) was not found in any of the preparations. A white jadeite from ma commences to decompose at 800°, and at 1015° is entirely con-ed into glass and nepheline.

L. J. S.

Bowen (Norman L.) & Schairer (J. F.). *Crystallization equilibrium of nepheline-albite-silica mixtures with fayalite.* Journ. Geol. Chicag 1938, vol. 46, pp. 397–411, 2 figs.

An equilibrium diagram is given of the system $NaAlSiO_4$–FeO–SiO_2 which the crystalline phases are cristobalite, tridymite, albite, fayalit nepheline, carnegieite, hercynite, and wüstite. The three eutectics a compared with volcanic rocks: the binary eutectic albite-fayalite wit fayalite-trachyte, the ternary tridymite-albite-fayalite with fayalit rhyolite, and nepheline-albite-fayalite with fayalite-phonolite. The rocks, it is suggested, are residuals of fractional crystallization. [M.A **5**–252, **7**–147.] L. J. S.

Schairer (J. F.) & Bowen (N. L.). *The system, leucite–diopside–silic* Amer. Journ. Sci., 1939, ser. 5, vol. 35 A, pp. 289–309, 6 figs.

Equilibrium diagrams are given for the ternary system and the thr boundary binary systems. There is one ternary eutectic, and the dio side field occupies a large part of the diagram. On fractional crystalliz tion the residual liquid approaches in composition a mixture of potas felspar and silica. L. J. S.

Goranson (Roy W.). *Silicate–water systems: phase equilibria in t $NaAlSi_3O_8$–water and $KAlSi_3O_8$–water systems at high temperatur and pressures.* Amer. Journ. Sci., 1938, ser. 5, vol. 35 A, pp. 71–9 5 figs.

With orthoclase the solubility relations are complicated by the chan to leucite and liquid. L. J. S.

Posnjak (E.). *The system, $CaSO_4$–H_2O.* Amer. Journ. Sci., 1939, ser. vol. 35 A, pp. 247–272, 4 figs.

A review is given of previous work with criticism of the conclusions van't Hoff (1903). 'Soluble anhydrite' is designated γ-$CaSO_4$, to d tinguish it from anhydrite (β-$CaSO_4$) and the high-temperature fo (α-$CaSO_4$). It shows a different X-ray pattern to that of the hem hydrate ($CaSO_4 . \frac{1}{2}H_2O$) [cf. M.A. **6**–351]; and it takes up moisture ve readily, changing to the hemihydrate. L. J. S.

Growth and Corrosion of Crystals.

Berg (W. F.). *Crystal growth from solutions.* Proc. Roy. Soc. Londo Ser. A., 1938, vol. 164, pp. 79–95, 1 pl., 6 text-figs.

Flattened cubes of sodium chlorate were grown from seed-crystals i

saturated solution between two half-silvered interferometer plates ng a slight wedge. The curvature of the interference bands due to ences in refractive index gives a measure of the concentration of the on surrounding the crystal. The concentration is found to be st at the corners of the crystal, but here the influx of material is It is assumed that a flow of material towards the corners takes along an adsorbed layer on the surface of the crystal. L. J. S.

ITZ (Max). *Umkristallisieren von kleinen Mengen.* Zeits. Krist., 937, vol. 96, pp. 328–329, 3 figs.

o methods are given for growing crystals of a reasonable size when a small amount of material is available. H. S.

TTOVKIN (D. D.). *Verteilung von Beimengungen bei Kristallisation.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1935, vol. 4, pp. 323–326, 3 figs.

explanation is suggested for the formation of dendritic crystals, anstetter structures, and regular periodic inclusions in crystals have grown rapidly; also for the localized attack producing etch-es. M. H. H.

YEL (E. v.). *Zum Problem der Sphärokristalle.* Zeits. Krist., 1937, ol. 97, pp. 67–87, 21 figs.

substances $NaHCO_3$, $CaCO_3$, $MnSO_4.4H_2O$, $Na_2S_2O_3.5H_2O$, $_2O_7$, and $Na_2C_2O_4$ form spherulitic groups of crystals when grown emperature of 60–110° C. in a solution which is evaporated quickly. lower temperature isolated crystals or regular groups appear d of spherulites, and many substances such as NH_4Cl, KCl, KI, &c., t form spherulitic growths under any circumstances. H. S.

ENSTERN (H.). *Wachstumsbeobachtungen an Alkalihalogenid-kristallen.* Zeits. Krist., 1938, vol. 100, pp. 221–227, 4 figs.

heres of LiF, NaCl, KCl, KBr, KI were immersed in solutions of the sponding salt and allowed to grow. Lithium fluoride gave no satis-ry result. Sodium chloride developed eventually the forms (100), , (210); potassium chloride and iodide a combination of (100) and ; potassium bromide tended towards a cubic shape. H. S.

TZE (W.). *Über regelmäßige Aufwachsungen einiger Alkalihalogenide auf Natriumnitrat.* Zeits. Krist., 1937, vol. 97, pp. 241–251, 6 figs.

gular growths on a rhombohedral face of sodium nitrate were

observed in the case of NaI, NaBr, KCl, &c. The typical position growth was that in which a cube edge of the halide was parallel to rhombohedron edge of the nitrate. H. S.

Royer (Louis). *Sur l'orientation de certains halogénures alcalins par calcite.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205, pp. 141 1420.

Heintze's experiments [preceding abstract] were repeated, as a res of which it is shown that almost all crystals of NaBr, NaI, KCl, KBr, K RbCl, or RbBr, when deposited on a cleavage flake of calcite are orient so that a cube face of the halide coincides with (100) of the calcite, wi one edge [100] of the cube coinciding with [100] or [110] of the calc rhombohedron. With NaCl orientation is less complete, and quite abs with NH_4I or RbI. Considerations of the relative dimensions of t lattices of these salts and of calcite leads to the conclusion that besi epitaxic groups due to approximate identity of three or two lattice pa meters, such groupings can also occur from identity of only one pa meter of each of the pair of lattices. C. A. S.

Leonhardt (J.) & Tiemfyer (R.). *Sylvin mit gesetzmäßig eingelagert Eisenglanz.* Naturwiss., 1938, vol. 26, pp. 410–411.

Sylvine has been found at Wathlingen with included haematite three regular orientations, (0001) of the latter being parallel to (10 (111), or (110) of the former. A. Johnsen's explanation (1909) for t regular association of haematite and carnallite cannot hold here. M. H. H.

Buckley (H. E.). *The regular association of $KMnO_4$ and $KClO_3$.* Ze Krist., 1937, vol. 97, pp. 370–385, 12 figs.

From mixed saturated solutions of $KClO_3$ and $KMnO_4$ parallel grow form readily. Usually a larger $KClO_3$ plate contains a number of les $KMnO_4$ crystals; but sometimes the associated $KClO_3$ and KMn crystals are of about the same size, especially if a little K_2SO_4 is ad to the solution. The edge [010] and face (100) of the permanganate parallel respectively to the edge [010] and face (100) of the chlora apart from a few doubtful exceptional cases. H. S.

Bradley (R. Stevenson). *Experiments on the range of surface for* Zeits. Krist., 1937, vol. 96, pp. 499–503, 5 figs.

Ammonium iodide crystallizes in a regular growth of tetrahed

als on a sheet of mica. The same is true, if the sheet of mica is first ed by a thin film of stearic acid, cellulose acetate, or rubber, pro- the thickness of the film does not exceed 10^{-5} cm. H. S.

TANOW (L.) & STRANSKI (I. N.). *Über die Kristallisation von Alkalihalogenidkristallen auf Fluorit.* Zeits. Krist., 1938, vol. 99, pp. 444–448, 5 figs.

e salts LiCl, LiBr, NaCl, NaBr, KCl, KBr, KI all grow with an edral face on an octahedral face of fluorite. Parallel growth is very narked in NaCl and fairly common in LiBr, NaBr, KCl. H. S.

LEMS (J.). *Über regelmäßige Aufwachsungen von p, p′-Dioxydiphenyl auf Calcit und Natriumnitrat.* Zeits. Krist., 1938, vol. 100, pp. 272–274, 2 figs.

freshly cleaved calcite or sodium nitrate p, p'-dioxydiphenyl grows stals of elliptical cross-section with their major axes parallel to a nal of the cleavage rhombohedron. H. S.

ZCZYNSKI (S. v.) & STOICOVICI (E.). *Über orientierte Verwachsungen von Covellin auf Zinkblende.* Zeits. Krist., 1937, vol. 96, pp. 389–395, 3 figs.

velline, from Băiţa, Transylvania, lies with a prism face on the (110) of blende crystals, and with the base on the faces (111) of the le. H. S.

DEL (Clifford). *Selective incrustation of minerals.* Amer. Min., 1937, vol. 22, pp. 1104–1116.

hen a solution of sodium nitrate crystallizes in the presence of us minerals, crystals are deposited on calcite. Numerous specimens ing two or more earlier minerals were examined for selective in- ation by a later mineral. Questions of similarity in crystal-structure f surface adsorption are considered. L. J. S.

DEL (Clifford). *Some mineral incrustations selective upon crystal forms.* Amer. Mus. Novitates, 1937, no. 918, 4 pp., 2 figs.

ecimens are described showing incrustations of blende on (111) lena, iron oxide or clay on $(10\bar{1}1)$ of quartz, and chalcopyrite on of blende. L. J. S.

Pabst (Adolf). *Orientation of bixbyite on topaz.* Amer. Min., 193 vol. 23, pp. 342–347, 6 figs.

Small crystals of bixbyite grown on the prism faces of a crystal topaz from Thomas Range, Utah, have a cube axis parallel to the *a*-ax of topaz and a cube face inclined at 32° 53′ to the right or left of the bas plane of the topaz. The two minerals show a coincidence in the atom spacings in these positions. L. J. S.

Himmel (Hans) & Kleber (Willi). *Ein Beitrag zum chemischen Abb von Kristallen durch Spiegelbildisomere. (Mit Ätzversuchen am Cal mit den 4 Weinsäureformen.)* Neues Jahrb. Min., Abt. A, 193 Beil.-Bd. 72, pp. 347–366, 3 pls., 4 text-figs.

A cleavage surface of calcite etched with *d*- and *l*-tartaric acids giv asymmetric, right- and left-handed etch-figures, while with racemic a *meso*-tartaric acids they are symmetrical [M.A. **5**–120]. The light-ban obtained on spheres of calcite when etched with the different acids a also described. L. J. S.

Bond (W. L.). *Etch figures of quartz.* Zeits. Krist., 1938, vol. 99, pp. 48 498, 37 figs.

A spherical surface of quartz was etched with HF, and 36 photomicr graphs (×70) were taken of different areas, the positions of which a indicated on a stereographic projection. L. J. S.

Garner (W. E.) & Pike (H. V.). *Dehydration nuclei on crystals of copp sulphate pentahydrate.* Journ. Chem. Soc. London, 1937, pp. 156 1568, 1 pl.

The etch-figures produced on different faces by dehydration in vacuu are described, and their forms discussed in relation to the cryst structure. L. J. S.

Rock-forming Minerals and Petrology.

Chudoba (K.) & Schilly (W.). *Der Einfluß der Kalifeldspatkompone auf die Optik der Plagioklase. IV. Die Auslöschungsschiefen auf d Flächen P (001) und M (010) der Plagioklase.* Zentr. Min., Abt. 1938, pp. 97–109, 6 figs. [M.A. **7**–21.]

Theoretical curves are deduced for the extinction-angles on *c* (001) a *b* (010) for series of mixed crystals Ab–An, Ab–Mi, and Ab–An–M

for Ab–An–Mi with 20 % Mi are close to and approximately
el to those for Ab–An. Only when Mi exceeds 10 % is the difference
le the error of observation. L. J. S.

LS (Agnes). *Chemismus und optische Orientierung kalifeldspat-haltiger Plagioklase.* Inaugural-Dissertation Univ. Bonn, 1937, vi+
5 pp., 7 figs.
me as before [M.A. **7**–21] in greater detail. L. J. S.

LS (Agnes). *Die chemische Stellung des Albits von Schmirn (Tirol) als Plagioklasendglied.* Zentr. Min., Abt. A, 1937, pp. 161–163.
e mean of two analyses, SiO_2 65·56, Al_2O_3 21·54, Fe_2O_3 0·32, MgO
CaO 0·08, Na_2O 10·87, K_2O 0·33, ign. 0·29 = 99·62, sp. gr. 2·610,
sponds to Ab 97·66, An 0·39, Mi 1·95—nearly an end-member of the
oclase series. Plots of the optical orientation on Reinhard's curves
nte, however, 3–4 % An, and previous optical measurements of
rial from this locality point to about 5 % An. L. J. S.

H (Tom. F. W.). *Feldspar equilibria and their implication I.* Norsk Geol. Tidsskrift, 1938, vol. 17, pp. 177–190, 4 figs.
e system Ab–An–Or is really a quaternary system, since orthoclase
es to leucite and silica before melting. But this is modified in
al magmas under pressure and in the presence of other substances.
omposition of two kinds of felspar (plagioclase and orthoclase solid
ions) present together in the same rock, when plotted on a tri-
lar diagram (Ab, An, Or), show for both kinds a parallel increase in
mount of soda, depending on the other minerals present to form
eaction series in various rocks, both volcanic and pegmatites.
L. J. S.

NG (Harold L.). *Plutonic perthites.* Journ. Geol. Chicago, 1938, vol. 46, pp. 142–165, 1 pl., 7 text-figs.
rthitic felspars in plutonic rocks show differences from the more
ied perthites in pegmatites. The host is usually a soda-bearing
oclase, or occasionally microcline, and the enclosed blebs range from
albite to andesine and rarely to labradorite. Forms of blebs are
nguished as stringers, strings, rods, beads, films, bands, patches, and
es. The smaller well-oriented blebs are due to exsolution at rela-
y high temperatures; while larger irregular blebs are due to later
cement by invading solutions at a lower temperature. L. J. S.

Montalto (Maria). *Anortoclasio di Ustica.* Atti Accad. Gioenia Sci. Na Catania, 1937, ser. 6, vol. 2, no. 8, 7 pp., 1 fig.

Crystals of anorthoclase from tuff on Monte Guardia di Mezzo ga $a:b:c = 0{\cdot}645:1:0{\cdot}557$, α 91° 19½′, β 116° 57½′, γ 90° 0′, and new form (450), (4$\bar{5}$0), (10$\bar{3}$), Bx_a nearly $\perp$ ($\bar{2}$01), 2V 51° 4′, negative, extinction (010) 8°, on (001) 2°, α 1·5190, β 1·5222, γ 1·5243. Analysis, SiO_2 66·2 Al_2O_3 19·65, Fe_2O_3 0·78, CaO 0·75, MgO 0·38, Na_2O 8·43, K_2O 3·6 H_2O 0·24 = 100·18; sp. gr. 2·582–2·590. L. J. S.

Pagliani (Giovanna). *L'albite delle druse del granito di Baveno.* Atti So Ital. Sci. Nat. Milano, 1937, vol. 76, pp. 331–339, 2 figs.

Crystals of albite encrusting orthoclase in cavities have sp. gr. 2·56 2·61, α 1·526, β 1·530, γ 1·537, 2V 78°, extinction on (010) 18°, on (001) 2 Analysis, SiO_2 66·26, Al_2O_3 20·16, CaO 0·62, MgO 0·10, Na_2O 10·8 K_2O 0·62, H_2O+ 1·30, H_2O- 0·22 = 100·08, corresponds with A 93·48, An 2·97, Or 3·55. L. J. S.

Rutherford (Ralph L.). *Crystal habit of the orthoclase in the Crowsn volcanics at Coleman, Alberta.* Univ. Toronto Studies, Geol. Se 1938, no. 41, pp. 67–69, 1 pl.

Porphyritic crystals weathered from trachyte are prismatic or tabul with the forms *b c m y z* (Dana's letters); 5·3 % are Baveno twins. L. J. S.

Partridge (F. C.). *Note on the green micas of north-eastern Transva* Trans. Geol. Soc. South Africa, 1937, vol. 39 (for 1936), pp. 457–46

The well-known green mica from Mashishimala, NE. Transvaal, h the properties of muscovite, and an analysis by C. J. van der W shows that it contains only 0·83 % Cr_2O_3. The name chrome-muscov is recommended, the chromium being considered characteristic of t granites of this region. E. D. M.

Miller (Franklin S.). *Hornblendes and primary structures of the S Marcos gabbro.* Bull. Geol. Soc. Amer., 1938, vol. 49, pp. 1213–12 4 pls.

Optical data are given for the following types of hornblende in th rocks from southern California: pale-green in olivine-rocks; deep-gre in norites; green-brown poikilitic in gabbros; pale blue-green, fibrous, later hydrothermal origin. In the rocks, banded, nodular, and orbicu structures are described. L. J. S.

ANEN (Anna). *On the petrology of Finnish quartzites.* Bull. Comm. géol. Finlande, 1938, no. 122, pp. 1–119, 10 pls., 3 maps, 29 text-figs. Dissertation Univ. Helsinki, 1938.

tailed accounts are given of the various types of quartzites, with cal and petrofabric analyses. Plots are also given of the directions optic axis in grains of strained quartz. Some of the brown man- silicate occurring as lenticles in quartzite, previously described odonite [M.A. **6**–478], is now referred to pyroxmangite. New es are given of pyroxmangite (I) and rhodonite (II) from Simsiö, n Finland, but there seems to be no sharp distinction between the The prism angle *mM* of pyroxmangite is 91° 41′.

$FeSiO_3$.	$MnSiO_3$.	$MgSiO_3$.	$CaSiO_3$.	Sp. gr.	α.	β.	γ.	$2V_\gamma$.
43	39	8	10	3·72	1·734	1·737	1·751	37½°
35	54	5	6	3·75	1·738	1·742	1·754	39½
23	62	6	9	3·68	1·731	1·734	1·749	40
20	74	0	6	3·65	1·732	1·737	1·744	72–92
20	66	5	9	3·68	1·729	1·734	1·744	66½
14	72	7	7	3·64	1·729	1·734	1·741	68–73½

merite from the quartzite at Vittinki gave III; β 1·695, γ 1·678, 16°. Grunerite from quartzite at Nurmo, IV; sp. gr. 3·441–3·452, , β 1·684, γ 1·708, 2V 95°, $\gamma:c = 15°$. Clinozoisite from clinozoi- rtzite at Hopiavuori, Kälviä, V; sp. gr. 3·215–3·230, α 1·670, 4–1·681, γ 1·691, 2V 31–55°.

SiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O+.	Total.
51·79	0·00	0·76	31·91	0·90	9·08	4·62	0·03		0·68	99·77
48·96	0·00	2·92	38·16	0·12	5·53	1·68	0·13	0·02	2·42	100·02
0·36	30·67	0·61	1·77	—	0·74	22·62	—	—	3·50	100·36

IV, also H_2O- 0·08. V, also TiO_2 0·09.

L. J. S.

YUCHENKO (D. P.)] Сердюченко (Д. П.). О воде амфиболов.— ERDIUCHENKO (D. P.). *Concerning water of amphiboles.* Изв. кад. Наук СССР, Отд. Мат. Ест., Сер Геол. (Bull. Acad. Sci. RSS, Cl. Math. Nat., Sér. Géol.), 1938, pp. 269–277, 3 figs. Russian with English summary.)

dehydration of three Uralian actinolites, chemical analyses of are given, shows that: (1) in the interval 100–400° little water is d there is no change of optical properties; (2) in the interval 00° the changes in the dehydration curve and in the optical pro- suggest a brucite grouping; (3) at 600–700° a leptochloritic

grouping is suggested, and at 700–800° a serpentine grouping; (4) main portion of water is lost at 800–900°, but its quantity is less th that suggested by Warren [M.A. **4**–278]; (5) near 900° amphiboles decomposed into an aggregate of pyroxene, magnetite, and cris balite (?). S. I. T

[Belshterli (M. K.)] Бельштерли (М. К.). Кристаллический кремнез [*Crystalline silica.*] Петрография СССР, Сер. III, Породообразу щие минералы, Вып. 1. Петр. Инст. Акад. Наук СССР [The pet graphy of USSR, Series III, Rock-forming minerals, vol. 1. Petro Inst. Acad. Sci. USSR], 1938, pp. 5–55, 27 figs.

[Vorobieva (O. A.)] Воробьева (О. А.). Оливин. [*Olivine.*] Ibi pp. 57–115, 8 pls., 14 text-figs.

[Soloviev (S. P.)] Соловьев (С. П.). Слюды. [*Micas.*] Ibid., pp. 1 183, 26 figs.

This is the first volume of a new series of the 'Petrography USSR' [M.A. **6**–242]. Each of the authors describes a group of miner and gives a review of their principal physical and chemical characte their occurrence, genesis, and artificial reproduction. A number analyses and bibliographies are given. S. I. T

Tomkieff (S. I.). *The classification of igneous rocks: an historical proach.* Geol. Mag. London, 1939, vol. 76, pp. 41–48.

A brief review of some systems of rock classification of the p microscopical, early microscopical, and present-day periods. The ea microscopical period of Zirkel and Rosenbusch produced attempts rock classification founded on a combination of both petrographical a geological factors. All such attempts have been failures. The o definite link between the two systems favoured by the author should in the major subdivision into igneous, sedimentary, and metamorp rocks. The petrographical classification should be based on the mine and chemical composition and on the texture (grain-size, fabric, a degree of crystallinity). W. C. S

Tröger (W. E.). *Eruptivgesteinsnamen. (1. Nachtrag.)* Fortschr. M Krist. Petr., 1938, vol. 23, pp. 41–90, 2 figs.

This is a first supplement of additions and corrections to the auth useful volume of reference on the manifold types of igneous ro [M.A. **6**–97]. New types are numbered ($40\frac{1}{2}$, $40\frac{2}{3}$, &c.) to fall into previous classification, and an alphabetical index of rock-names

nded. One-quarter of the new names are due to A. Johannsen .. 7–111], and in a preliminary note various authors of new rock-s come in for criticism. L. J. S.

ɛBERG (A. S.), OSIPOV (M. V.), & SEMENOV (F. G.)] Гинзберг (А. С.), Осипов (М. В.), и Семенов (Ф. Г.). Кристаллизация литых изделий без отжига. [*The crystallization of cast products without annealing.*] Труд. Второго Сов. Экспер. Мин. Петр., 7–10 мая 1936 г., Акад. Наук СССР [Trans. Second Confer. Exper. Min. Petr., 7–10 May 1936, Acad. Sci. USSR], 1937, pp. 187–207, 11 figs.

ne importance of obtaining well-crystallized cast basic rocks without ıling led the present authors to investigate the effect produced by ddition of various magnesia-rich rocks to the fused diabase. The ion of actinolitite, hornblendite, serpentinite, picrite, and talc-ite-rock to diabase has provided useful data. S. I. T.

ɛTKOV (A. I.)] Цветков (А. И.). Некоторые данные по кристал-изации плавленного диабаза. [*Certain data on the crystallization of fused diabase.*] Труд. Второго Сов. Экспер. Мин. Петр., 7–10 мая 1936 г., Акад. Наук СССР [Trans. Second Confer. Exper. Min. Petr., 7–10 May 1936, Acad. Sci. USSR], 1937, pp. 209–229, 11 figs.

rocessive annealing of cast diabase allowed the study of the order of allization and of the nature of minerals developed in the solid cast ase. At 1250° C. minute crystals of magnetite make their appear-out of a previously opaque glass, and the glass begins to clear and dex of refraction changes from 1·577 to 1·569. At 1200° plagioclase ıt $Ab_{20}An_{80}$) begins to crystallize out, and at 1150° the maximum ber of its centres of crystallization is reached. At 1100° pyroxene 18, γ 1·736, $\gamma:c = 45°$) begins to crystallize. Subsequent annealing not add any new minerals, but only promotes the formation of netite, plagioclase, and pyroxene. The final product is a well-allized rock with only a small amount of glass (n 1·546). Frequently, formed crystals of plagioclase enclose patches of glass which later part assimilated by the host and in part goes towards the formation omorphic crystals of magnetite. This suggests that idiomorphism not always mean an early crystallization. S. I. T.

AROVICH (M. P.) & FRIDMAN (R. S.)] Воларович (М. П.) и Фридман (Р. С.). Исследование вязкости смесей диабаза и пикрита в расплавленном состоянии.—VOLAROVICH (M.) and FRIDMAN

(R.). *Investigation of viscosity of the diabase and picrite mixtur in the molten state.* Труд. Петр. Инст. Акад. Наук СССР (Tra Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 13, pp. 197–201, 2 fig (Russian with English summary.)

The viscosity of diabase-picrite mixtures increases with the additio of picrite at temperatures 1200–1300° C. At temperatures 1300–1400° the viscosity curve shows a maximum for a mixture containing 20% picrite. S. I. T.

[Fersman (A. E.)] Ферсман (А. Е.). Геохимия конечной магма тической кристаллизации. [*The geochemistry of the final magmat crystallization.*] Пегматиты СССР. I. Под редакцией акад. А. Е Ферсмана и И. И. Гинзбурга. Ломон. Инст. Акад. Наук ССС [*The pegmatites of USSR. I.* Edited by A. E. Fersman and I. Ginzburg. Lomonossov Inst., Acad. Sci. USSR], 1936, pp. 5–51

[Althausen (M. N.)] Альтгаузен (М. Н.). Канское месторожден пегматитов. [*Kansky pegmatite deposits.*] Ibid., pp. 53–265, 87 fig

[Rokhlin (M. I.) & Solovieva (E. V.)] Рохлин (М. И.) и Соловье (Е. В.). Улялегские пегматиты. [*Ulyalegsky pegmatites.*] Ibid pp. 267–308, 20 figs.

This volume, the first of the new series, contains three papers o pegmatites. Unfortunately non-Russian summaries are not provide In the first paper Fersman gives a concise account of the geochemist of pegmatites. In the second paper Althausen provides a detaile description of pegmatites from the region of the river Kan (betwee Krasnoyarsk and Irkutsk, Siberia) with a large number of analyses rocks and minerals. In the third paper certain pegmatites from Karel are described. S. I. T.

[Vlasov (K. A.)] Власов (К. А.). О теории десиликации гранитны пегматитов.—Vlasov (K. A.). *Concerning the desilication theory granitic pegmatites.* Изв. Акад. Наук СССР, Отд. Мат. Ест., Се Геол. (Bull. Acad. Sci. URSS, Cl. Math. Nat., Sér. Géol.), 193 pp. 297–334, 2 figs. (Russian with English summary.)

Although the term 'desilication' is not adequate to express the who complex of processes occurring between an acid pegmatite fluid and t basic or ultrabasic rocks, it can still be used if its wider meaning is unde stood. Desilication can take place only when the granite-pegmatit magma is rich in boron, fluorine, and water, and the country-rock is ri in magnesia and iron. A detailed study of the physico-chemical pr

es that take place after the intrusion shows the possibility of the ation of various elements from the pegmatitic fluid into the country- and vice versa, with the resulting formation of successive zones of biotite, phlogopite, (*b*) actinolite, chlorite, and (*c*) talc. The impor- e of this study lies in the elucidation of the formation of corundum, rald, and beryl. [Cf. M.A. **7**–3.] S. I. T.

PLETSKY (B. M.)] Куплетский (Б. М.). Формация нефелиновых сиенитов СССР. [*The nepheline-syenite formation of USSR.*] Петрография СССР, Сер. II, Монографии, Вып. 3. Петр. Инст. Акад. Наук СССР [The petrography of USSR, Series II, Monographs, vol. 3. Petrogr. Inst. Acad. Sci. USSR], 1937, 307 pp., 22 figs.

detailed account is given of the nepheline-syenites and genetically ted rocks found in the Kola peninsula, the Urals, Siberia, and Central . The rocks are described and all previously published chemical and al analyses of them are given, as well as the analyses of the minerals nging to this formation. It is suggested that the nepheline-syenites other alkali rocks may have been formed in three different ways: s differentiation products of granitic magma; (2) as differentiation ucts of ultrabasic magma; (3) as products of assimilation of country- ks followed by differentiation. [M.A. **7**–35.] S. I. T.

EDEV (P. I.)] Лебедев (П. И.). Барий в изверженных породах Украины.—Lebedev (P. I.). *Barium in the igneous rocks of Ukraine.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 12, pp. 155–171, 10 figs. (Russian with English summary.)

he distribution of barium in the igneous rocks of Ukraine is discussed. he charnockite series the amount of BaO varies from 0·20 to 0·48, the monchiquite-camptonite series from 0·16 to 0·68%, while the ount of barium in the associated nepheline-syenite is very small. mparison with other regions is made and genetic inferences drawn.

S. I. T.

RIN (N. A.)] Сирин (Н. А.). Геолого-петрографическое описание габбрового массива Ялпинг-Нер на северном Урале.—Sirin (N. A.). *Geological and petrographical description of the gabbro intrusive body of Yalping-Ner in the northern Ural.* Труд. Петр. Инст. Акад. Наук СССР. (Trav. Inst. Pétrogr. Acad. Sci. URSS),

1937, no. 11, pp. 17–69, 1 map, 13 text-figs. (Russian with Englis summary.)

The plutonic complex of Yalping-Ner (62° N., 60° E.) is composed gabbro, peridotite, pyroxenite, diorite, and plagioclase-granite. Th associated minor intrusions include gabbro-pegmatite, anorthosite, hor blendite, spessartite, diabase, &c. The igneous rocks are intruded int the upper Silurian and Devonian sediments and lavas (spilite, &c.). detailed petrographical description and 17 analyses of rocks are give

S. I. T.

[Ginzburg (I. I.)] Гинзбург (И. И.). Геохимия коры выветривани серпентинитов южного Урала.—Ginzburg (I. I.). *Geochemistry the serpentinites weathering shell in the southern Urals.* Изв. Акад Наук СССР, Отд. Мат. Ест., Сер. Геол. (Bull. Acad. Sci. URSS Cl. Sci. Math. Nat., Sér. Géol.), 1938, pp. 35–94, 1 pl., 5 text-figs (Russian with English summary.)

This is a chemical and mineralogical study of the ancient zone weathering of serpentinites of the southern Urals. Three types name after localities are distinguished: (1) Halilovo type—in which undis turbed serpentinites are affected by weathering, and the horizons (fro above) are as follows: (*a*) ochreous, (*b*) nontronitized, (*c*) leached serpe tinite with opalized and aragonitized subhorizons, (*d*) magnesite; (2 Akkermanian type—irregular, affecting tectonically disturbed serpe tinites; (3) Ufaleyian type—produced at or near the contact of serpe tinites and limestone. Besides ochreous and siliceous iron ore there ar numerous occurrences of nickel silicate ore, especially well developed i the third type of the zone of weathering. Numerous chemical analyse are given.

S. I. T.

[Soustov (N. I.)] Соустов (Н. И.). Новый щелочный массив в окрес ностях Хибинских тундр на Кольском полуострове.—Soustov (N. I.). *A new alkaline intrusive body in the vicinity of the Hibinsk toundras on the Kola peninsula.* Труд. Петр. Инст. Акад. Нау СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 12, pp. 89 105, 17 figs. (Russian with English summary.)

A newly discovered intrusion (? sill), to the south of the Khibin tundra in the Kola peninsula, is composed of alkali-syenite and nephe line-analcime-syenite. The crystallization of microcline-perthite an nepheline was followed by cataclastic effects and late magmatic product filled the cracks, partly replacing felspar and nepheline. The late mag

products are analcime, cancrinite, calcite, albite, biotite, and te. Two analyses of rocks are given. S. I. T.

LETSKY (B. M.)] Куплетский (Б. М.). Пироксенитовая интрузия ст. Африканда на Кольском полуострове.—KUPLETSKY (B. M.). *The pyroxenite intrusion near Africanda station on the Kola peninsula.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 12, pp. 71–88, 6 figs. (Russian with English summary.)

small igneous complex, intrusive in Archaean gneisses, is composed rroxenite and olivinite rich in titanomagnetite and knopite [M.A.] and is cut by veins of nepheline-pegmatite. The prevalent fine-ed pyroxenite (anal. I) is similar to a jacupirangite and is com-l of diopside-hedenbergite (α 1·695, γ 1·721, $\gamma:c = 38–43°$, 2V 54–positive), augite, acmite, magnetite, and calcite. One of the alkali-atites is an ore-ijolite (anal. II) and is composed of nepheline, ene, titanomagnetite, calcite, and apatite. Calcite in these rocks magmatic origin and numerous calcitite veins, representing the othermal phase of the magma, are found. It is suggested that the enites and olivinites have been formed by an ultrabasic magma has assimilated carbonate rocks, and that the nepheline rocks ent the residual magma. Analyses of knopite, titanomagnetite, te, melilite, natrolite, mica, and pyroxene are given.

SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.
41·20	3·63	3·14	9·56	7·70	0·20	12·20	20·22
37·96	3·46	16·89	6·48	3·60	0·14	3·63	16·58

BaO.	Na_2O.	K_2O.	P_2O_5	V_2O_5.	CO_2.	H_2O+.	H_2O-.
0·03	1·03	0·18	—	—	0·60	0·40	0·06
0·05	3·46	2·45	0·71	trace	1·50	2·65	0·50

Total I. 100·15 II. 100·06 S. I. T.

SEEV (N. A.), ZELENKOV (I. V.), NEFEDOV (N. K.), & UNKSOV (V. A.)] Елисеев (Н. А.), Зеленков (И. В.), Нефедов (Н. К.) и Унксов (В. А.). Геологическое строение и петрографический состав Ловозерских тундр.—ELISEEV (N. A.), ZELENKOV (I. B.), NEFEDOV (N. K.) and UNKSOV (B. A.). *Geological structure and petrographical composition of the Lovozersky toundras.* Изв. Акад. Наук СССР, Отд. Мат. Ест., Сер. Геол. (Bull. Acad. Sci. URSS, Cl. Math. Nat., Sér. Géol.), 1938, pp. 235–268, 10 figs. (Russian with English summary.)

e plutonic complex of Lovozero (Luyavrurt) [M.A. 7–196, 209] is

intruded into pre-Cambrian and Devonian rocks thermally altered the contact. It is a saucer-shaped body composed of strongly band rocks. The intrusive phases are: (1) various nepheline-syenites, tavi urtite, and juvite; (2) loparite-bearing foyaite, urtite, lujavrite (low part of the complex); (3) eudialyte-bearing lujavrite (upper part of t complex); (4) late dike complex, principally represented by monchiqui and tinguaite. The rocks are described and a number of modal analys are given. S. I. T.

[Ozhinsky (I. S.)] Ожинский (И. С.). Конгломерат Турьего мыса.— Ozhinsky (I. S.). *Conglomerate of Turiy cape.* Изв. Акад. На СССР, Отд. Мат. Ест., Сер. Геол. (Bull. Acad. Sci. URSS, Cl. S Math. Nat., Sér. Géol.), 1938, pp. 95–105, 3 figs. (Russian wi English summary.)

A conglomerate interbedded with sandstones of the Turya peninsul Kola, contains, besides fragments of underlying granodiorite and san stone, fragments of igneous rocks of the alkali complex of Turya [M. **6**–424], and in its lower part is intruded by alkali-basalt which cemen the fragments of other rocks. This suggests that the igneous rocks of t alkali complex are of the same age (Devonian?) as the sandstone. S. I. T.

[Sazonova (Z. A.)] Сазонова (З. А.). Петрография базальтов Чешск губы.—Sazonova (Z. A.). *On the basalts of Cheskaia bay.* Труд. Пет Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URS 1938, no. 12, pp. 107–154, 17 figs. (Russian with English summary

The basalts of post-Permian age from Cheskaia bay, northern Russi are described. Particular attention is paid to the chloritic mesostas (palagonite) found in these basalts. Several analyses of basalt a palagonite are given, and comparison is made with similar material fro Franz Joseph Land and Ireland. A late magmatic origin of palagoni is postulated, and palagonite spheroids are attributed to the liquati differentiation of the residual magma. [Cf. M.M. **21**–73.] S. I. T.

[Lebedev (A. P.)] Лебедев (А. П.). К петрографии северо-восточно Алтая.—Lebedev (A.). *On the petrography of the northeaste Altai.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrog Acad. Sci. URSS), 1938, no. 13, pp. 77–103, 13 figs. (Russian wi English summary.)

The igneous and metamorphic rocks of the region of the lake Telezk Altai, are described and four analyses are given. S. I. T.

EEV (N. A.)] Елисеев (Н. А.). Петрография рудного Алтая и албы.—[*The petrography of the ore-bearing region of Altai and of Kalba.*] Петрография СССР, Сер. I, Региональная петрография, ып. 6, Петр. Инст. Акад. Наук им. Ф. Ю. Левинсон-Лессинга. The Petrography of USSR, Series I, Regional Petrography, vol. 6. Petrographical Institute F. Y. Levinson-Lessing, Acad. Sci. USSR], 1938, 248 pp., 2 maps, 8 pls., 43 text-figs. [M.A. **6**–242.]
is volume of the series 'The petrography of USSR' contains a led account of the igneous, metamorphic, and sedimentary rocks of rn Altai. Palaeozoic spilite-keratophyre series, various intrusive s, and contact altered rocks are described, and 88 chemical analyses iven. S. I. T.

AR (V. A.)] Вакар (В. А.). Геологическое строение северо-осточного Приколымья.—[*The geological structure of the north eastern part of Kolyma region.*] Труд. Арктич. Инст. (Trans. Arctic nst.) Leningrad, 1937, vol. 90, pp. 57–96, 1 map, 11 text-figs.
e geology of the northern Anui range, Kolyma region, NE. Siberia, scribed. Three cycles of igneous activity are distinguished: (1) o-Triassic—spilite and porphyrite lavas and diabase intrusions; Mesozoic —volcanic phase represented by quartz-porphyry tuff; nic phase—by quartz-gabbro, diorite, potash- and soda-granite; (3) ary volcanic and hypabyssal dacite, andesite, and basalt; and ernary trachybasalt and andesito-basalt. S. I. T.

AR (V. A.) & MOLDAVSKY (M. L.)] Вакар (В.) и Молдавский (М.). Петрографическая и петрохимическая характеристика горных пород северо-восточного Приколымья.—VAKAR (V.) and MOLDAVSKY (M.). *Petrographical and petrochemical characteristic of rocks in the northeastern part of the Kolyma region.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1938, no. 13, pp. 21–75, 7 pls., 1 text-fig. (Russian with English summary.)
petrographical description of the rocks of Kolyma region (preceding act), supported by numerous analyses, is given. V. Vakar describes edimentary and effusive rocks, and M. Moldavsky the intrusive and act-metamorphosed rocks. [Cf. M.A. **6**–320, **7**–206.] S. I. T.

ERIKHS (F. M.) & SVETLOVSKY (A. E.)] Дитерихс (Ф. М.) и Светловский (А. Е.). Петрографический очерк южных склонов вулкана Шевелуч (Камчатка).—DITERICHS (F.) and SVIATLOVSKY (A.).

Short petrographical description of the southern slopes of the Sheveluc Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Aca Sci. URSS), 1938, no. 13, pp. 105–116, 4 figs. (Russian wi English summary.)

The last eruption of the volcano Sheveluch, Kamchatka, occurred 1928, and at the present time the volcano remains in a solfataric pha The lavas described are a hornblende-pyroxene-andesite and an augit basalto-tephrite. Two chemical analyses are given. S. I. T.

Morozov (A. I.). *A note on a new Kamchatka rock.* Bull. Kamchat Volcanological Station, Acad. Sci. USSR, 1938, no. 3, pp. 19–20.

Kamchatite is a new name given to a porphyritic igneous rock fro Sredinnyi range in Kamchatka. The rock is composed of orthocla (large phenocrysts), bluish hornblende, pyroxene, and epidote. Analy by N. N. Shavrova gave SiO_2 51·70, TiO_2 0·47, Al_2O_3 13·13, Fe_2O_3 2·2 FeO 6·03, MnO 0·19, MgO 3·61, CaO 8·13, BaO 0·16, Na_2O 1·95, K 6·24, P_2O_5 0·14, H_2O— 0·09, ign. loss 1·92 = 100·05. Chemically th rock is similar to potash-rich monzonite or shonkinite, but, unlike the it has no plagioclase. S. I. T.

Guimarães (Djalma). *Das Problem der Granitbildung.* Chem. Erd 1938, vol. 12, pp. 82–94, 4 figs.

The residual products in the crystallization of a basic magma are ri in SiO_2, K, and volatiles. These may invade sedimentary and other roc producing granitization. L. J. S.

Knopf (Adolph). *Partial fusion of granodiorite by intrusive basalt, Owe Valley, California.* Amer. Journ. Sci., 1938, ser. 5, vol. 36, pp. 37 376.

The granodiorite has developed a columnar structure and sho colourless glass (n 1·495) at the contact of quartz and felspar grains. Th glass locally encloses minute prisms of hypersthene, probably deriv from biotite, but the main part of the biotite has been transformed in magnetite and spinel (?) without fusion. The basalt (without column structure) contains fragments of granodiorite, grains of quartz a felspar, and a brown glass (n 1·505). L. J. S.

Nockolds (S. R.). *Contributions to the petrology of Barnavave, Carlin ford, I.F.S. 3: On some hybrids from the E. and S.E. slopes of Barn vave Mountain.* Geol. Mag. London, 1938, vol. 75, pp. 469–479, 3 fig

The normal eucrite consists of a brown diallagic pyroxene (α 1·68

23, $\gamma:c = 41°$, 2V 63°; anal. I) and basic plagioclase ($Ab_{19}An_{81}$–n_{70}), sometimes with orthorhombic pyroxene as intergrowths with onoclinic pyroxene. The rock is invaded by small veins and patches alic material (Na_2O 1·24, K_2O 3·37 %) presumably from a granitic a. In the eucrite so modified the pyroxene shows brown and zones (α 1·698, γ 1·728, $\gamma:c = 51°$, 2V 80° in the green portion; I, the bulk composition of the zoned crystals) and the plagioclase is albitic ($Ab_{45}An_{55}$–$Ab_{55}An_{45}$). Analyses of the rocks are also given.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O.
	50·63	0·63	3·28	1·53	8·92	0·10	14·80	19·34	0·16		0·88
	46·88	2·08	4·69	3·89	10·67	0·05	10·40	19·78	0·79	0·58	0·49

L. J. S.

OLDS (S. R.) & RICHEY (J. E.). *Replacement veins in the Mourne Mountains granites, N. Ireland.* Amer. Journ. Sci., 1939, vol. 237, pp. 27–47, 5 figs.

row veins of dark-green greisen cutting aplite veins in the granite near the margins of the mass. They consist of quartz, blue-green topaz (α 1·616, γ 1·626, 2V 58°) with some fluorite and stilbite. sis I of the blue-green mica (α 1·582, $\beta = \gamma$ 1·625, 2V 0–7°, nega- hows it to be siderophyllite for which a new formula is $H_4K_2Fe_3$ O_{24}. Analyses of the granite and greisen show for the latter a gain F, H_2O, (Al, Li) and loss of Na, (K, Ca, Si). Later are fissure veins joint-planes. These consist of chlorite with fluorite and apophyl- nal. II of the chlorite (α 1·663, $\beta = \gamma$ 1·669, 2V near 0°, negative) it to be daphnite.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O.
	39·60	0·21	22·80	0·79	20·98	0·29	0·46	1·52	trace	8·95	3·17
	25·07	0·12	19·78	3·50	35·80	0·50	1·11	1·04	0·18	0·93	11·95

I, F 2·03, H_2O+ 2·93, H_2O- 0·24. II, H_2O+ 10·82, H_2O- 1·13.

L. J. S.

A (Pentti). *On the esboitic crystallization of orbicular rocks.* Journ. eol. Chicago, 1938, vol. 46, pp. 448–485, 23 figs.

criptions are given of orbicular rocks from various localities, in- g four new finds in Finland, with many pictures and chemical es, and detailed discussion of their origin. In the more common type the dominant plagioclase is oligoclase or andesine. [M.A. 5–226, 6–304.]

L. J. S.

Andrew (Gerald). *On the imperial porphyry.* Bull. Inst. Égypte, 1
vol. 20, pp. 63–81, 1 pl.

The porfido rosso antico, which was quarried by the Romans
Gebel Abu Dokhan (27° 13′ N., 33° 17′ E.), is an andesitic or dacitic
coloured red by haematite and withamite. It is a local alteration of
grey pyroclastic rock which contains green epidote. The withar
occurs as grains in the groundmass and in the porphyritic felspar, an
needles in quartz veins; $\gamma - \alpha$ 0·025, γ: (001) = 29°, 2V 50°, positive; p
chroism, α colourless, β yellow, γ pink. L. J.

Fenner (Clarence N.). *Contact relations between rhyolite and basal
Gardiner River, Yellowstone Park.* Bull. Geol. Soc. Amer., 1
vol. 49, pp. 1441–1484, 8 pls., 2 text-figs.

A rhyolite flow on an old basalt surface penetrated and veined
basalt and encloses corroded xenoliths of the basalt. The basalt near
contact is much modified, yielding mixed rocks intermediate in comp
tion between rhyolite and basalt (18 chemical analyses). It is sugge
that here was pneumatolytic action similar to granitization. L. J.

Wolff (John E.). *Igneous rocks of the Crazy Mountains, Montana.*
Geol. Soc. Amer., 1938, vol. 49, pp. 1569–1626, 18 pls., 2 fol
tables of chemical analyses, 18 text-figs.

A summary account of this region, which has been visited by
author since 1883. The rocks include many types, ranging from gra
to peridotites, and also alkalic types. Many chemical analyses (ap
ently all previously published) are given of the rocks and of s
minerals (felspars, pyroxenes, and amphiboles). L. J.

Willemse (J.). *On the Old Granite of the Vredefort region and some
associated rocks.* Trans. Geol. Soc. South Africa, 1938, vol. 40
1937), pp. 43–119, 3 pls., 24 text-figs.

Rocks invaded by the Vredefort granite include metamorphosed
ments (andalusite-hornfels, garnet-quartz-felspar-rock, and magne
hypersthene-garnet-quartz-rock) and metamorphosed igneous r
(actinolite-schist hornblende-schist, pyroxenite, and amphibolite
which descriptions and chemical analyses are given. Evidence is add
for progressive thermal metamorphism subsequent to regional m
morphism and itself followed by retrogressive metamorphism. In
contact-metamorphosed sediments, garnet occurs in iron-rich, cordi
in magnesium-rich rocks. The magnetite-hypersthene-garnet-qu

s distinguished from typical eulysite. In the granite itself the ence of oligoclase, perthite, quartz (often itself containing quartz rs), ilmenite, epidote, sphene, and pyroxene is discussed, while ende is characteristically rare. The texture varies from granitoid phyritic and granophyric; while an acid dike in the granite is con-l to be much later. Analyses are given and the granite is shown to ole the Old Granite generally on chemical grounds. The associated otachylyte and basic granophyre are described, together with es. Examination of the former by optical and X-ray methods no evidence for the existence of glass. The granophyre consists of clase and orthopyroxene in a micropegmatitic groundmass con-g frequent xenoliths, and occurs both as a granular and a fibrous y: it is shown to represent a contaminated lamprophyric magma. ry structures of the granite played an important role in determin-e form of the Vredefort dome. E. D. M.

ARD (M. S.). *South African melilite basalts and their relations.* rans. Geol. Soc. South Africa, 1937, vol. 39 (for 1936), pp. 281–316, 1 figs.

occurrence and character of melilite-basalt from Spiegel river Heidelberg, and from Robertson, Sutherland, and Gamoep in rn Bushmanland, are described, all being located in the Cape nce. Nepheline, analcime, and serpentine occur in different speci- and new chemical analyses are given for rocks from the last three ties. Melilite has crystallized in part at least at the expense of ene, but no field evidence is available to explain the high lime-nt of these rocks. Kimberlite is of cognate origin and sometimes s in association. E. D. M.

Y (L. F.) & GREIG (J. W.). *Note on the temperature attained in a ning coal seam.* Amer. Journ. Sci., 1939, vol. 237, pp. 116–119, 1 fig.

Y (L. F.). *Note on the occurrence of minute gastropods in a holo-rystalline slag.* Ibid., pp. 120–123, 5 figs.

urning coal seam in Coal Canyon, Coconino Co., Arizona, has baked djacent sandy shales, and along chimneys the shale has been fused un along joints, producing a 'box' structure. The fused product ts of a felspar near anorthite, pyroxene, magnetite, and a little and has the texture of basalt. It melts at 1117–1232°. In it are shells replaced by chalcedony. L. J. S.

Frankel (J. J.) & Kent (Leslie E.). *Grahamstown surface quartz* (*silcretes*). Trans. Geol. Soc. South Africa, 1938, vol. 40 (for 193 pp. 1–42, 3 pls., 1 text-fig.

The silcretes occurring on the peneplain surrounding Grahamstov Cape Province, are shown to depend in their texture and heavy resid upon the underlying formations, implying an origin in place. They classified as silicified sands and silicified clays, and their mode of ori is discussed in some detail. E. D. M

Haff (John C.). *Preparation of petrofabric diagrams.* Amer. Min., 19 vol. 23, pp. 543–574, 1 pl., 16 text-figs.

Details of the method of determining the orientation of mineral gra in rock sections and of plotting the results. L. J.

Miscellaneous.

Blix (Ragnar). *On the chemical composition of the magnetoplumb* Geol. För. Förh. Stockholm, 1937, vol. 59, pp. 300–302.

A new analysis of magnetoplumbite from Långban, Sweden [M.A. 3- gave, after deducting 1·19 % admixed mica, TiO_2 4·14, PbO 20·02, Al 1·86, Cr_2O_3 0·25, Fe_2O_3 52·22, MnO 19·25, MgO 0·15, CaO 0·28, O 1· H_2O 0·08 = 100·00, and the new formula $RO.5R_2O_3$. L. J. S

Sztrókay (Kálmán). *Antimonit Kisbányáról és Borpatakról* (*Szatmár r* [*Stibnite from Kisbánya and Borpatak* (*com. Szatmár*).] Mat. Ter tud. Értesítő, Budapest, 1938, vol. 57, pp. 911–917. (Hungaria

On crystals of stibnite from Kisbánya 38 forms were determined in prism zone, including new (190), (290), (2.11.0), (370), (380), (4.11 (5.12.0), (870), and (13.9.0). Crystals from Borpatak show only *b n* [Dana's axes and letters.] V. Z

Orcel (Jean) & Caillère (*M*^{lle} Simonne). *Nouvelles observations sur transformations des prochlorites magnésiennes sous l'action de chaleur.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 207, pp. 788–7

Dehydration curves of amesite, sheridanite, leuchtenbergite, grochauite all indicate marked loss of H_2O at about 620° and 810°. X- examination of sheridanite and leuchtenbergite show little change structure, only a slight contraction of the lattice, though about 5% is lost on heating for 60–70 hours at 580–590°. Heated at 900–930° 24 hours some 11 % H_2O is lost and the diagram changes considera indicating formation of olivine. This change is more marked if

ng be at 1000° for 15 minutes, and still more so if the powder be d for 1 hour at 1400°, when production of olivine, spinel, and silli- ce is evident. There is no indication of formation of MgO or garnet. magnesian prochlorites behave similarly. C. A. S.

IENNE (Henri). *Sur l'altération des silex crétacés, dans les sables upérieures de la Perte du Rhône, à Bellegarde.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 207, pp. 295–297.

ese flints usually form small, often angular fragments, and consist central horny solid portion surrounded by a patina of whitish rial. The centre in such cases consists mainly of opal, increasingly formed into chalcedonite as the exterior is approached.

C. A. S.

ATTI (S.). *Contributo alla conoscenza della sepiolite.* Atti (Proc. Verb.) Soc. Toscana Sci. Nat., 1937, vol. 46, no. 5, reprint 12 pp., 1 fig.

ray powder photographs of a mineral from Serrazzano, Pisa, pre- ly described by the author as possibly parasepiolite [M.A. **5**–382], a pattern identical with that of sepiolite from Grant Co., New co. The fibres of both give straight optical extinction (ortho- bic, not monoclinic), but the refractive indices differ; for the t Co. mineral n 1·535–1·540. Material from various other localities ibed in the literature also shows differences in n, and it is suggested epiolite consists of a mixture of two minerals. [M.A. **6**–477.]

L. J. S.

RCIGH (E.). *Sulla presenza della nahcolite al Vesuvio.* Rend. Accad. Sci. Fis. Mat. Napoli, 1937, ser. 4, vol. 7, pp. 19–25.

alysis of an encrustation collected in 1934 in the Valle dell' Inferno, 26·24, Cl 18·15, HCO_3 20·76, CO_3 1·39, Na 33·08, K 0·10 = 99·72, terpreted as Na_2SO_4 38·90, NaCl 29·83, $NaHCO_3$ 28·58, Na_2CO_3 %, and microscopical examination showed thenardite, halite, and olite. L. J. S.

ONI (P.). *La copiapite dell' isola del Giglio.* Atti (Proc. Verb.) Soc. Toscana Sci. Nat., 1936, vol. 45, pp. 24–26, 1 fig.

alysis of a sulphur-yellow efflorescence on a rock containing pyrite SO_3 38·46, Al_2O_3 2·22, Fe_2O_3 26·02, FeO 0·64, MgO 2·21, CaO 0·28, 0·27, H_2O 30·28 = '100·58'. The minute orthorhombic crystals abular on (001); optic axial plane (010), obtuse bisectrix $\gamma \perp$ (001).

L. J. S.

Thilo (Erich) & Schünemann (Heinz). *Chemische Untersuchungen v Silikaten. IV. Über das Verhalten des Pyrophyllits* $Al_2(Si_4O_{10})(OH$ *beim Erhitzen und die Existenz eines „wasserfreien Pyrophyllit* $Al_2(Si_4O_{10})O$. Zeits. Anorg. Chem., 1937, vol. 230, pp. 321–33 4 figs.

Loss of constitutional water from pyrophyllite commences at 400° a is complete at 1100°. The water-free material is more soluble in NaO solution and in HCl, and the X-ray pattern is practically identical wi that of talc. Above 1150° it yields mullite and cristobalite. L. J. S.

Berg (Ernest L.). *An occurrence of diaspore in quartzite.* Amer. Mi 1937, vol. 22, pp. 997–999, 1 fig.

The Sioux quartzite (Algonkian) of SW. Minnesota and SE. Sou Dakota contains grains of diaspore (α 1·700, β 1·720, γ 1·752), whi has perhaps been formed by leaching of an aluminous silicate.

L. J. S.

Berg (Ernest L.). *Notes on catlinite and the Sioux quartzite.* Amer. Mi 1938, vol. 23, pp. 258–268, 7 figs.

Catlinite ('pipestone') occurs as a bed 15–18 inches thick of red met morphosed shale in quartzite at Pipestone, Minnesota. It consis mainly of sericite with some pyrophyllite, diaspore, haematite, & Analysis by R. B. Ellestad gave SiO_2 49·01, TiO_2 0·44, Al_2O_3 35·1 Fe_2O_3 3·06, MgO 0·23, CaO 0·05, Na_2O 0·06, K_2O 5·62, Li_2O 0·16, H_2O 5·63, H_2O— 0·24, ign. (less H_2O) 0·24 = 99·91. The quartzite is metamorphosed sandstone cemented by pyrophyllite and diaspore.

L. J. S.

[Borovik (S. A.), Vlodavetz (N. I.), & Prokopenko (N. M.)] Боров (С. А.), Влодавец (Н. И.) и Прокопенко (Н. М.). Распространен индия в свинцово-цинковых месторождениях Средней Азии. Borovik (S. A.), Vlodavetz (N. I.) and Prokopenko (N. M *Occurrences of indium in lead-zink deposits of middle Asia.* Из Акад. Наук СССР, Отд. Мат., Ест., Сер. Геол. (Bull. Acad. S URSS, Cl. Math. Nat., Sér. Géol.), 1938, pp. 335–340. (Russi with English summary.)

Spectroscopic and chemical tests for indium in various sulphi minerals of Central Asia show that indium occurs mainly in zinc-blend and that this is probably due to the proximity of the atomic radii indium and zinc. S. I. T.